Rhododendrons

1956

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RHODODENDRON SOCIETY

RHODODENDRONS

by

The American

Rhododendron Society

This is a book we have long needed. It tells how to grow rhododendrons right here in our own country. It is written by American growers, both amateur and professional. Here are their experiences with hundreds of types of plants, both hybrid and species—the plants they live and work with every day in the year. The men who have written and compiled this book know the theory as well as the practical end of rhododendron culture, breeding and propagation.

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Photo J. Harold Clarke

Rockery on the Island, Rhododendron Test Garden, Portland, Ore.

RHODODENDRONS

1956

THE AMERICAN RHODODENDRON SOCIETY

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PORTLAND 17, OREGON

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INTRODUCTION

Many gardeners have wondered where the word 'Rhododendron' came from. It is a derivative of the Greek language, 'rhodon' meaning rose and 'dendron' meaning tree; therefore, the rose tree. Botanically it is defined as a "genus of showy shrubs or small trees of the heath family with profuse clusters of beautiful flowers."

The native habitat of the genus Rhododendron is in the mountainous regions of the Northern Hemisphere, especially in the Himalayas. It is found in the Eastern United States, and on the West Coast it grows extensively in Washington and Oregon. It is the State Flower of Washington.

Western China, Tibet, and Burma have furnished to the plant world probably a greater abundance of exotic plant material, including Rhododendrons, than found elsewhere in this world of ours.

Dating back as early as the year 1700, explorations were carried on by England, importations made, and through Kew Gardens and others this plant material from China was made available to plant lovers in England, Europe and the United States, and to this day English Hybrids are still being supplied. Some very good Hybrids are being furnished by Holland, and the nurserymen and amateurs of the United States are making some excellent crosses.

This book, called "Rhododendrons" and published by the American Rhododendron Society, a National organization since 1945 is dedicated to the membership and others who may have interest in the growing of Rhododendrons and Azaleas, also known botanically as Rhododendrons.

It is a book we have long needed; how to grow Rhododendrons in our own country, written by our own growers, telling of their experiences with hundreds of types of plants, both hybrids and species, which they live and work with every day in the year. The men and women who have written and compiled this book know the theory as well as the practical end of Rhododendron culture, breeding and propagation.

This book, "Rhododendrons," is the effort of a Committee of the American Rhododendron Society, appointed by the writer of this Introduction. To all of the Committee members and to all the contributors, my sincere thanks for a job well done.

C. I. SERSANOUS
President

FOREWORD

This is the sixth in a line of books published by the American Rhododendron Society, five Yearbooks, 1945 to 1949 inclusive, and now this one, not a Yearbook but of that general type. If there were a word for a book published at approximately five year intervals then this would be it. It was the feeling of the Directors of the Society some years ago that the effort put into the Yearbooks could better be directed to the Quarterly Bulletin, and so that organ of the Society has flourished. It did seem, however, that there was certain factual material which would fit better in a cloth bound volume than in the Bulletin, even though most Rhododendron enthusiasts file their copies for reference purposes. It was not the intention to set up a rigid five year schedule but that a volume should appear whenever there was enough material available to warrant publication, probably about once in five years.

The information included in the following pages is mostly of two general types. One is cultural information, including growing requirements, propagation, and pest control, for which there is constant demand from new Rhododendron enthusiasts, and it isn't practical to continually reprint these things in the Bulletin. The other type of information consists of reference material which will be of value to experienced growers, as well as beginners, and which should logically be available in a book of some sort. Under this category would be the variety ratings, list of American varieties, Code of Nomenclature, etc.

The devoted work, and often brilliant accomplishments of American breeders should not be disparaged by having the story considered as mere reference material, and yet it is something which prospective breeders and most interested growers will want to preserve for future study.

Rhododendron enthusiasts are a studious lot, always ready to 'run down' an unknown plant in whatever literature they may have available. I have been surprised at the range of their reading and desire to further their knowledge of the genus. As an aid to further study the Index of the Quarterly Bulletins and the list of Rhododendron literature are included. It is information which, if it had been available, would have been very much appreciated by me a few years ago when I suddenly found myself deeply involved in Rhododendrons.

As might be expected in so large a group of plants as the genus Rhododendron it is impossible to have 'all the truth' at any one moment. New facts appear every day: the botanists in the interest of accuracy change familiar names to those less familiar; the breeders make new crosses and name new clones; the scientists discover new methods, and so while we have striven to give a correct account of this fluid subject we know there will be omissions and possibly mistakes, for which we ask your indulgence. We have edited the contributions from our very competent chapter authors but have tried not to change their style or submerge their individuality.

The American Rhododendron Society, as a group, has been just as much interested in the Azalea series as in those types commonly spoken of as Rhododendrons. When this book was first considered members of the Committee felt that most of the desirable and available information about Azaleas had been included in the Azalea Handbook, published in 1952 by the American Horticultural Society. It seemed advisable, therefore, to omit special Azalea information except as it appears incidentally in the text of some of the chapters.

ACKNOWLEDGMENTS

We are grateful to many individuals for their assistance and encouragement in the preparation of this book. Probably a hundred and fifty people have had a hand in it, either by filling out questionnaires, contributing material, or serving on committees, and we thank them all. We are especially grateful to the authors of our special chapters, James Wells, Harold Epstein, David Leach, Robert Bovee, C. T. Hansen, Dr. Bowman, Dr. Breakey, Dr. Gould and Dr. Eglitis. Those who have ventured to name their five favorite Rhododendrons for a particular use or location have our grateful appreciation. Pictures have been furnished by Rudolph Henny, Cecil Smith, and John Bacher. Robert Bovee, a member of our Committee well trained by experience in the field has been especially helpful in connection with printing and engraving problems. The other members of the Book Committee, Mrs. Ruth Hansen, George Grace, and Rudolph Henny have spent tedious hours going over the questionnaire returns and helping to establish ratings in those cases where there was no clear agreement by the members at large. In this task Arthur Wright also gave us the benefit of his experience. The Officers and Directors of the Society have spent considerable time considering the problems involved in getting out a book of this type and have been uniformly

helpful and encouraging. The Hansens, Rudolph Henny and Robert Bovee have helped to read proof, and so has Mrs. Clarke, and probably Mrs. Henny and Mrs. Bovee. And finally we are grateful to the many friends of the Society who have sent in advance orders for the book, grateful for the orders but also for their patience when the job proved to be a little larger than expected and the date of publication was considerably later than had been anticipated.

J. Harold Clarke,
Long Beach, Washington,
Editor

Photo Rudolph Henny

R. houlstonii of the Fortunei series, grown by Rudolph Henny, Brooks, Ore.

RHODODENDRON CULTURE

J. HAROLD CLARKE

Rhododendrons are sometimes considered difficult plants to grow. However, those who have seen them growing wild in the Appalachians, or along the Oregon coast, or in the mountains of western Washington and Oregon may well marvel at their ability to survive. There they hold their own in competition with grass, weeds and forest trees in spite of drouth, wind, bugs and the occasional thoughtless motorist who breaks off branches by the trunk load. The lesson to be gained here is that Rhododendrons, like most plants, will thrive where the conditions are right. Let's consider those conditions.

It is important to remember that Rhododendrons make up a very large botanical group and so different species and varieties may be expected to vary considerably in their requirements. However, most kinds prefer (1) cool summer temperatures, (2) relatively warm winters, (3) abundant moisture but good drainage, (4) a relatively acid soil—about pH5 is good, and (5) lots of organic matter in the soil. But many other common garden shrubs would also prefer some or all of these conditions so don't be discouraged if your garden lacks them. Rhododendrons are being grown more and more widely and in areas previously thought to be entirely unsuitable. You can do a great deal to make conditions in your garden more favorable whether you are in good Rhododendron country or not.

For Favorable Areas

Where soil and climate are favorable there are several things one can do to make the most of these natural advantages. Although some varieties seem to prefer full sun, at least in the Northwest, most will appreciate some shade in the middle of the day. The planting site should be chosen with this in mind.

Few mineral soils have as much organic matter as Rhododendrons would like. Mix plenty of peat moss, leaf mold or sawdust with the soil when planting, unless the soil is naturally well drained and with a high organic content. These materials will loosen up heavy soils and increase the water holding capacity of very sandy soils. When

planting in a very heavy soil it would be advisable to make a hole at least two or three times the diameter of the root ball, and fill in around the ball with a mixture of half and half soil and peat, or sawdust. Set plants as deep as, or very slightly deeper than they were in the nursery.

After planting mulch well with leaves, sawdust or peat to conserve moisture, help keep down weeds, and eliminate cultivation which would injure the shallow roots. Recent researches indicate that almost any kind of sawdust, either fresh or partially decayed, is satisfactory.

Use sufficient fertilizer to maintain a good green color. This will require about twice as much nitrogen with a sawdust mulch as if the soil is kept cultivated. It used to be thought that sawdust would "poison" the soil, because plants mulched with it would usually turn yellow and stop growing. Research finally showed this to be due to lack of nitrogen, caused by the rapid increase of the micro-organisms which feed on the sawdust and cause it to decay. These micro-organisms require nitrogen for their own growth and are in a favorable position to grab what is applied to the surface of the soil, before the plant roots can get it. With a permanent mulch more extra nitrogen will be needed the first year, than in succeeding years, as the micro-organisms which have taken up the extra nitrogen eventually die, decay, and release it for re-use by other micro-organisms or the plants.

Various forms of nitrogen may be used but one of the best is ammonium sulfate. Research work with certain other ericaceous plants indicates they use nitrogen in the ammonium form rather than the nitrate form. If that is true for Rhododendrons, as it may well be, it would mean that, if materials like nitrate of soda are used, the nitrogen would have to be changed to ammonium before it is usable, hence it would appear to be slower acting. Ammonium sulfate leaves an acid residue, usually desirable for Rhododendrons, but it might possibly cause the soil to become too acid under certain unusual conditions.

In most cases it may be desirable to use a complete fertilizer which will contain phosphorus and potassium in addition to nitrogen. Certainly if a soil is deficient in phosphorus or potassium, so that either of them gives beneficial results with vegetables or annual flowers, then they should be used for Rhododendrons also. The modern trend is to try to supply whatever elements may be deficient in the soil and not to use a specific formula for each type

of plant being grown. Lack of magnesium occasionally causes Rhododendron leaves to be pale yellow between the veins while the veins themselves remain green. To correct this condition magnesium may be applied as magnesium sulfate (Epsom salts), at a rate of half a pound to 100 square feet. Sulfate of magnesia potash is a good source of both magnesium and potash.

Fertilizer on mulched plants should be applied early enough for the rains to wash it down through the mulch or else it must be well watered in. Avoid late applications of fertilizer which would stimulate fall growth and make plants more susceptible to winter injury. Applications in early winter are not likely to stimulate undesirable growth but may be effective in causing better color in nitrogen-deficient soils.

Water enough to keep the soil moist. In very dry weather it will be necessary to water even heavily mulched soils.

FOR VERY COLD AREAS

Where winter temperatures are likely to go below zero the first requisite for success is to choose varieties carefully. If the climate is quite severe, with temperatures going to —15°F or below most winters, it would be best to stick to the old hardy Catawbiense hybrids, or others in the H-1 or H-2 hardiness groups. For slightly warmer areas many of the H-3 varieties are satisfactory. It should be remembered that the climate in one general area may vary over a wide range, depending on elevation, exposure to winds, direction of slope, nearness to large bodies of water, etc.

If possible get a fairly reliable estimate of what the minimum temperature might be in the spot where you want to plant. A maximum and minimum thermometer will be a big help in determining this. Observations during even one winter will be of great value in choosing planting sites. Even on the small, perfectly level lot the climate will be different on different sides of the house or on the north or south sides of a clump of evergreens.

Protection from winter winds is important to prevent damage to foliage. If it is necessary to plant in an exposed place temporary windbreaks of burlap, evergreen boughs or other materials may be advisable. Mulching deeply with leaves during the winter will help protect the lower part of the trunk which is sometimes more susceptible to injury than other parts of the plant.

Photo J. Harold Clarke

Rhododendron Test Garden, Portland, Ore. Soil and climate seem to be ideal.

In the colder areas particular care should be taken to avoid stimulation of growth in late summer and fall, by fertilizing only in early spring, and watering no more than is necessary after August first.

FOR HOT, DRY CLIMATES

Azaleas are now being grown somewhat more generally in hot, dry climates than are other members of the Genus Rhododendron. The true Rhododendrons require the same general conditions as Azaleas but are somewhat more exacting in their requirements.

Selection of planting site is particularly important in hot climates in order that the plants may have light shade during the middle of the day. The north side of a building is good. A lath house would be excellent and could be an attractive garden feature and a pleasant place for the gardener to work. Shade from trees, if not too dense, is fine but under some conditions certain shallow rooted species such as Maples, Poplars, Willows, Spruce, etc., will

send so many roots into a specially prepared bed that the Rhododendrons will be practically choked out. To offset this you may have to cut the tree roots around the Rhododendrons, put in some kind of a barrier, or so improve growing conditions for the trees by watering and fertilizing that they will not have to be so aggressive. A rich, well watered bed in poor, dry soil is bound to attract tree roots.

Rhododendrons do not like strong winds of any kind. Plant so they will be protected from hot, dry winds especially.

Good drainage is important, even in hot, dry areas. If the soil is a heavy clay use tile or even build a special bed above ground level. If the bed is raised more careful attention must be given to watering as such a bed will dry out rapidly.

Usually it will be desirable to mix at least one half peat, sawdust, or leaf mold with the soil since natural organic matter in hot soils tends to disappear rather rapidly. Where soil conditions are particularly unfavorable it may be desirable to prepare a bed of pure peat moss.

If the soil is not sufficiently acid, ammonium sulfate as a source of nitrogen will also tend to acidify the soil. Where soils are more alkaline than pH6 it would probably be desirable to consult the local County Agricultural Agent as to how much sulfur you would need, under your particular conditions, to bring the acidity down to about pH5. Any soil acidification treatment may have to be repeated every year or so where the water used on the plants is very alkaline.

Since Rhododendrons are sold balled and burlapped, or in cans, they may be moved at any time, but in hot, dry country early spring, while it is still cool and moist, would be best. Fall or winter planting where the winters are mild is good.

A heavy mulch with sawdust (new or old), peanut hulls, crushed corncobs, or other similar material is very desirable. You will find Rhododendron roots most numerous near the surface of the soil and some even up into the mulch. Cultivation is bad for such shallow rooted plants. And don't forget that organic matter such as peat, and particularly sawdust when worked into the soil, or used as a mulch will tie up the nitrogen so it will be necessary to use at least twice as much as would be needed in the same soil without the mulch. This may be even more important in hot climates than in cool.

Rhododendrons do not like dry soil so the dry-country gardener

Photo J. Harold Clarke

(Loderi G.) 'Pink Diamond', shown by George Grace in the 1955 Portland Show and judged 'best truss in show.'

will have to have a consistent watering program, although the plants may be kept somewhat dryer in the fall so they will harden up and be more resistant to cold. Sprinklers are desirable as Rhododendrons like water on their leaves. In very hot weather a continuous spray on the foliage during the hottest part of the day will help prevent "heat injury." During dry spells examine the soil under mulch frequently and give a good soaking before it becomes too dry.

Ample plant food is required by Rhododendrons. If other plants require a complete fertilizer, containing nitrogen, phosphorus and potassium, use as much for Rhododendrons on the same soil. Most

ordinary garden fertilizers, whether "acid type" or not will probably be all right provided the nitrogen comes from ammonium or from an organic source and the soil pH is checked occasionally. If the leaves are pale, yellowish green, the need for more nitrogen is indicated. If it is not noticed until late in the summer it might be best to wait until winter to apply it so as not to force out soft growth which might be winter injured.

Chlorosis or yellowing of the leaves, which cannot be corrected by the use of nitrogen, may indicate the lack of available iron. If the veins only were green, of course, it might indicate lack of magnesium. Some garden fertilizers now come complete with the minor elements although in some cases the supplement is quite small. It is also possible to get mixtures of the minor elements in soluble form. In certain soils, however, the iron, which may be present in plentiful supply, is in an unavailable form and if added as ordinary iron salts will be quickly "fixed" and unavailable to the plant. There have been some recent important developments in this field of minor element, and particularly iron, supply. A material known as 'fritted trace elements' has these elements baked into a glass-like material where they are practically insoluble, although the plant's feeding rootlets are able to extract the essential elements. A great deal of work has been done recently with chelated materials, especially iron. These chelates are organic compounds, usually organic acids, which hold the iron in such a way that it is not "fixed" by the soil but remains soluble and available to the plant over a long period. Certain types of chelating agents are preferable for acid soils and others for alkaline soils. It has been said that the chief reason acid-loving plants such as Rhododendrons, grow better on an acid than on an alkaline soil is because iron is more available in the acid soils and that they will grow well on alkaline soils if supplied with sufficient iron in available form. We can be sure that the new forms of iron will greatly extend the area in which Rhododendrons can be grown. However, most of our alkaline soils are in regions of low rainfall and high summer temperatures which are also difficult conditions for Rhododendrons.

Certain Rhododendron pests are likely to be worse in hot, dry climate. The recommendations given elsewhere in this book should make possible satisfactory control.

Varieties undoubtedly vary in their adaptability to hot, dry conditions. Unfortunately, only a small percentage of the many hundreds of varieties and species available have been carefully

Photo J. Harold Clarke

Scene in Rhododendron Park in Hendricks Park, Eugene, Ore. The Eugene Chapter started in 1950 by raising $2500 for the project, has been contributing plants and labor ever since.

tested in the South. We are learning, and hope soon to be able to recommend a list which will be relatively resistant to heat and drouth. There is some evidence Azaleas propagated by cuttings or layers, on their own roots, will withstand unfavorable conditions better than grafted plants. That probably applies in general to Rhododendrons also so it would seem to be the part of wisdom to set own root plants if possible. This generality would not preclude certain varieties having especially poor root systems, and such varieties might do better grafted on some stronger growing stock plant.

THE PROPAGATION OF RHODODENDRONS A REVIEW

JAMES S. WELLS

In the two decades just past, the art of plant propagation has become a science and the average plant lover, interested in raising a few plants for his own enjoyment, may well be somewhat bewildered by the vast array of scientific aids, data, instructions, counter-instructions, and seemingly conflicting techniques, which are publicized on every side. Because of the somewhat complex nature of the Rhododendron, this group of plants has come in for somewhat more than its share of pseudo-scientific treatment, and it is hoped this article may clear the air somewhat and clarify some of the confusion, which most certainly exists.

Now it might seem from the foregoing that I decry the scientific advances which have been made in the past twenty years. This, of course, is completely untrue, because I believe that by the common sense application of principles now more clearly understood due to the efforts of the scientists, we are able to produce better plants in every way. The problem really centers around the sifting out of apparently conflicting ideas, so that we can see clearly the central core of the idea upon which most growers are working, many of them unconsciously.

Before we get down to the actual technicalities of propagation, I would like to briefly discuss two aspects of these modern advances which I believe to be of immense value in our work of propagating better Rhodendrons. They are (1) the control of water and (2) the use of growth promoting substances or plant hormones. Let us consider them briefly in that order.

THE IMPORTANCE OF WATER TO GROWING PLANT TISSUE

The amount of water that a growing plant requires is sometimes astonishing to those who do not have to tend them daily, but when we come to consider propagation by cuttings or grafting, we have to realize that this is a particularly critical period for the plant material in question. Here for a time it has lost its connection with the root

system, which formerly supplied it with water. The ease and rapidity with which it can make a new system in the case of cuttings, or establish effective union with another plant, which already has a root system, as in grafts, largely determines success or failure in such work. In either instance, growth of new cells has to take place. In cuttings, a whole set of roots has to be produced by the development of a large number of new cells, organized into a complex system. In grafts, new cells must be formed on the cut surfaces of both stock and scion, which can form a union capable of producing both conducting and supporting tissues. Growth in plant cells is a very complex process indeed, and the living matter in these cells—protoplasm—has to be manufactured. This, like any manufacturing process, requires a great deal of energy. It also requires a great deal of water, for like many manufacturing processes, far more water is used during the process than finally enters into the finished product.

Water is usually lost by a plant through transpiration. The rate of transpiration is, to a large extent, regulated by small pores (called stomata) located in the epidermis on the surface of the leaf. These are usually more numerous on the lower surface than the upper surface, but some plants have them about equally distributed, and a few have them only on the upper surface. The opening and closing of these stomata is regulated by a series of factors. The general turgor, or plumpness of the tissues of the leaf reacts on the cells surrounding the stomata; thus, when a leaf begins to lose water excessively, the stomata usually close before we can detect visible wilting. This closure of the stomata, upon incipient wilting of the leaf, even when wilting cannot be visibly detected may, if long continued, interfere with normal intake of carbon dioxide by the cutting, thus seriously lowering its ability to make enough food to keep going properly.

Incipient but not visible wilting, caused by a rise in day temperatures, and consequent lowering of atmospheric humidity, can lead to slow striking of roots or even failure because of forced closure of the stomata during daylight hours. Unfortunately, this closure of the stomata, at the onset of wilting, does not completely stop water loss. As a result, in the great majority of cuttings and grafts, every effort must be made to reduce water loss as much as possible. Under normal conditions, no moisture is lost from a leaf in the actual form of water. The water leaves the plant in the form of invisible gaseous

vapor. This means that the water vapor is at a higher concentration in the spaces between the cells inside the plant than in the air surrounding them and passes out from the plant by diffusion. Thus, in the handling of propagating material the obvious method of cutting down water loss from plant parts is to bring the humidity of the air surrounding the cutting or graft up to the point where there is a balance, and where no more diffuses out of the plant than can be taken up even in its temporarily rootless condition. This is the basic principle upon which all methods of controlling atmospheric humidity in propagating units are based.

The control of water, while plants are being manipulated to increase them vegetatively, has been a major factor in the methods used by good propagators since propagation became a craft, and many systems were devised to this end, although the main purpose was only subconsciously understood. The waxing of a dormant graft to exclude air is one method used for centuries for the controlling of water immediately around the cut surfaces of the graft. The use of double glass or sweat boxes, which has been a standard procedure in good nurseries the world over for a very long time, is again directed to the maintenance of a warm, humid atmosphere, heavily charged with water vapor immediately around the plant material being worked. The greenhouse itself is a structure designed to give the propagator greater control over the natural fluctuations of atmospheric heat and moisture. The Wardian case, devised for the transportation of plants over great distances, is but a small, well-constructed greenhouse, from which the water vapor cannot readily escape, so that the air inside can be maintained at close to 100% humidity. Besides these complex methods of controlling water, the simple damping down of a greenhouse is aimed at the maintenance of a high atmospheric humidity. The applications of coarse humus material, such as a mulch, around the base of plants maintains a cool, moist root run for those plants that tend to be surface rooting, as do most Rhododendrons and Azaleas. More recently, latex compounds sprayed on the leaves to reduce transpiration and sheet plastic for so-called air layering and for the covering of greenhouse benches have been aimed at the one problem, the control of water. Water is such a universally available material and one which is used so regularly that we tend to take it for granted and to under-rate the effect it can have, if used in a controlled manner, upon the methods which we use. Application of these general thoughts on the control of water

will be made from time to time as we proceed, but I wanted to draw your attention to the whole concept of water control before going further.

GROWTH CONTROLLING SUBSTANCES OR HORMONES

It is rather unfortunate that, due to lack of proper knowledge and understanding of the growth-regulating substances, they have in some cases rather fallen into disrepute, and there are still many good growers who choose to maintain that there is not a plant in existence which they cannot root as successfully without hormones as with them. To this opinion I cannot subscribe, for I have proven to my satisfaction, time and time again, that in the rooting of certain Rhododendrons the use of quite strong hormone powders is highly beneficial. I believe that those growers who are most critical of them have tended to assume that the use of hormones would automatically overcome all the other many problems which face the would-be propagator, such as timing, type of material, medium, method of making the cutting, etc. Hormones are no substitute for the thoughtful skill and careful judgment of the knowledgeable propagator. All the care and attention to detail which the good propagator would give is still required when using hormones. However, I am quite certain that, no matter how careful or skillful the propagator might be, there are certain types of plants which, without the use of hormones, would elude him. I am, of course, thinking particularly of propagating commercial quantities because that is my business, but the principle holds good whether you are rooting ten or ten thousand cuttings. A general knowledge of the use of hormones is advisable if you are interested in the propagation of a wide range of varieties, and for those who are interested, there are some good books, (1, 2, 3, 4) giving excellent references to work already accomplished with these chemicals.

To clinch this argument and to illustrate also the value of controlled use of water, I would like to give you the following results from tests on Rhododendron 'Kate Waterer.'

Rhododendron 'Kate Waterer'—Taken August 16. Lifted October 22. Medium: 75% Peat, 25% Sand. No humidification.

25 taken. Single heavy wound, no hormone treatment. Not rooted 21, dead 4. Percentage rooted, nil.

25 cuttings treated with 2% IBA. 10 rooted, 15 not rooted. Percentage rooted, 40%.

Rhododendron 'Kate Waterer'—Medium: 75% Peat. 25% Sand. Taken under humidification.

50 cuttings. Wounded. No treatment. 10 rooted. Percentage, 20%.

50 cuttings treated with 2% IBA. 44 rooted. Percentage, 88%.

From these two tables one can see the effect of both hormone treatments and of humidification. As always, these and other methods of handling the cuttings are complementary. They interchange and inter-react and it is essential that the proper place for each of these facets of our plant propagation work is clearly understood and integrated one with the other. I have chosen to discuss these two aspects of general propagation techniques because I believe them to be of prime importance in our present day methods of growing Rhododendrons of all kinds. We shall return to these preliminary notes time and again in our following discussions; therefore, with this as a background, let us consider the various types of propagation in order as they progress from seed.

PROPAGATION BY SEED

The use of Sphagnum moss is now a well established procedure in the production of many plants and because of its great advantage in the production of regular and even stands, I prefer to sow my Rhododendron seed on a bed of shredded Sphagnum moss. A most excellent bulletin has been put out by the U. S. Department of Agriculture, entitled "Sphagnum Moss for Seed Germination," Leaflet No. 234, which gives the finer details of this method. Dry Sphagnum moss, as purchased from the local florist, or green moss, alive, and as gathered from local ponds or bogs, are equally suitable. The moss is carefully shredded through a quarter inch sieve to produce a fine, even texture and to remove foreign matter. If the moss is dry, then it is thoroughly damped down and left for a day or two, perhaps being damped again so that the full amount of water is absorbed by the moss. A flower pot, an Azalea pan, or a standard flat, can all be used for seeds. I prefer to fill the pan with a mixture of 50% Michigan Peat and 50% Sharp Sand, firming this down to within one inch of the top. Upon this Peat-Sand mixture I place a half inch layer of damp shredded moss and carefully consolidate this so that a level even surface of moss is ready to receive the seed.

Seed can be sown at any time after being collected, but I prefer

to delay until about Christmas. By sowing at this time, we can carry the seedlings along in the greenhouse and have them ready for pricking out as young seedlings, with two sets of leaves, by mid-May. The seed has to be sown with great care because it is extremely fine, and although we have tried to bulk up the seed with sand, dry sifted peat, and other similar materials, we have always found that more even sowing can be achieved by carefully cupping the seed in the palm of the hand and gently shaking it over the bed of Sphagnum moss. Seeds are not covered in any way but just come to rest on top of the moss and then, when the flats are in their final position in the greenhouse bench, they are carefully sprayed with an extremely fine nozzled spray to damp the seeds and settle them on the moss bed. These flats are then covered with double glass or with a sheet of plastic, in order to insure an even degree of temperature and humidity. Sphagnum moss will hold up to 14 times its own weight in water and by reason of its structure provides an infinite number of small pockets into which the fine seeds eventually find their way. Each one of these small pockets, being surrounded by the cellular tissues of the moss fully charged with water, is in effect a small cell which is steadily maintained at practically 100% humidity. The lightest of sprayings on the top of the moss once or twice a day or the covering of the moss with a sheet of polyethylene plastic will completely eliminate fluctuations of water supply and insure the regular and steady germination of the seeds. The difference in the germination of Rhododendron and Azalea seeds when sown on moss in this way as against Dutch or Canadian type Peat is quite marked; only one trial of the Sphagnum moss method is needed to show how much superior it is to any other method.

An adaptation of this Sphagnum moss idea was described sometime ago in the Royal Horticultural Society's Rhododendron Yearbook, 1953, by Mr. Hanger, the Curator of the Wisley Gardens in England. He suggested the use of small plastic food containers, such as are used to store food in the refrigerator. This container was filled with shredded Sphagnum moss, the Rhododendron seeds were sown on the surface, as just described, and the lid then firmly fixed to the top of the container which completely eliminated evaporation of water. The seedlings germinated rapidly, evenly, and developed without incident. This seems to be an excellent method for the small grower or amateur gardener to use for the production of limited quantities of plants from seed. You will note that in my

original remarks I suggested filling the container with a mixture of half peat and sand and topping this with a layer of Sphagnum moss, while later the plastic container was filled with Sphagnum moss only. Both methods are quite satisfactory and I believe that where a thin layer of Sphagnum moss is overlaid on a base of finely divided peat and sand, it is somewhat easier to remove the seedlings when they have to be spotted on. This, however, is of minor importance. The Sphagnum moss, undiluted, is highly satisfactory and it does have the added advantage of allowing young seedlings to be held over almost indefinitely if they are just kept moist and all forms of nutrients withheld. The holding over of surplus seedlings in this way, in a sort of state of suspended animation, is very well described in the Government bulletin mentioned above, and I have proven to my own satisfaction that it works splendidly for periods as long as two years.

The flats or pans are maintained in a greenhouse at a temperature of from 65 to 70 degrees and under these conditions, with the combined warmth, humidity and partial shade, prompt and even germination results. Damping off in these young seedlings is conspicuous by its absence if Sphagnum moss is used as the base upon which to sow. However, if it does appear, it can usually be controlled by treating the seedlings immediately with normal strength Semesan, a mercurial compound usually readily available from your local garden store.

The seed germinates quite rapidly, and, in the course of two or three weeks, some air can be given, and, from then onwards, the seedlings should develop steadily until they are ready to spot on at the end of about six months. I prefer to use flats or pans for this purpose, making up a mixture of half top soil, half Michigan peat, to which I add a dash of sand. The mixture, of course, will depend upon the nature of the top soil. If it is somewhat heavy, then a greater proportion of sand is added; however, the pH of the soil must, of course, be from 4.5 to 5.5 for optimum results. If the seedlings are carefully spotted as soon as they are in their second rough leaf, they will grow on through the remainder of the growing season, so that at the end of the first year they will be from two to three inches in height, perhaps somewhat larger on more vigorous growing varieties. These young seedlings can be set out in open ground beds the following spring to grow on under shade and irrigation into plants suitable for permanent planting. If the seedlings are being raised to produce grafting understocks, then they will

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UPPER LEFT. A nice flat of *R. ponticum* seedlings to be used as stocks for grafting. UPPER RIGHT. Spacing the seedlings. CENTER LEFT. Well grown understock ready for trimming. CENTER RIGHT. How the understock is cut. LOWER LEFT. A single plant layered and pegged down. LOWER RIGHT. A vigorous young plant in the nursery row, ready for pinching.

probably grow for a second year in the beds to produce pencil sized plants for lifting late in the fall of the second year.

PROPAGATION BY GRAFTING

The propagation of Rhododendrons by grafting may not be a method practiced very frequently by the amateur grower, but there is no reason why he should not graft a few plants if he cares to do so. The most common understock used is *R. ponticum*, and were it not for its susceptibility to a Phytophthora disease which frequently kills the understocks, it would be an ideal one to use. Seedlings of Rhododendron 'Roseum Elegans' are sometimes used for grafting, as are seedlings of *R. maximum*, but the latter I do not consider a good understock. If good two year old seedlings of either *R. ponticum* or 'Roseum Elegans' are available, then these can be lifted as pencil thickness plants from open field beds in October, potted into 3" pots into a well prepared, peaty soil, and maintained in a greenhouse under gentle heat of 65° to encourage root development. When the pot balls are vigorously rooted, which should be by the end of December, grafting can commence. Contrary to popular belief, complicated equipment is not necessary for proper grafting, and in fact, excellent results may be secured by making an ordinary side graft, and then plunging the graft in a greenhouse bench in a bed of moist peat. Usually a double sash or sweat box is used. The point of union should be covered and a brisk bottom temperature of from 70° to 75° maintained to insure rapid and vigorous callousing. Under these conditions, callous formation will take place quite rapidly, and, at the end of three or four weeks, union between stock and scion should be complete. This union has to be hardened up carefully by the slow removal of peat from the point of union. If this is done too rapidly, the scion may wilt, the calloused tissue turn brown and shrivel, and, of course, the graft will die. Careful hardening up of the point of union, however, can be accomplished over a period of a few days, and the plants can then be lifted from the peat bed and placed on top of the bench to thoroughly harden up Some western propagators prefer the saddle graft to the side graft.

The unnatural process of grafting restricts the normal root development of the understocks in the pot ball, and usually at the end of the six-week grafting period the root system on the understock will have become quite dormant, and the roots will appear brown. Temperatures need to be lowered, the plants well watered, and ample

air given to encourage the re-rooting of the understocks in the pots. When this is seen, the understock can be slowly cut back until it is finally removed altogether and the scion remains now well established on the understock. Plants can usually be hardened off and prepared for planting in the open ground by mid-April at the latest, but, if the plants are well hardened off, then I would prefer earlier planting if the ground is workable. The earlier the young plants are set out, within reason, the better.

FRAME GRAFTING

A similar method of grafting can be employed in an ordinary cold frame, the only difference being that the time is altered. When grafting in this way, one has to use all the natural forces of spring growth to aid in the proper union of the graft. Mid-April, therefore, is the best time for this procedure, depending, of course, upon locality, but, if grafts are made as described above and the grafts plunged in a peat or peat and top soil mixture in a cool frame and immediately covered with sash and shaded, quite good percentages should have united by the end of May. At this time more air and light can be given, and by the middle of June the sash can be removed, the understock headed back, and the plants hardened up for normal growth in the frame through the summer. They should not be disturbed at this time but should grow through the season in the cold frame, remaining there through the next winter, and should be lifted early the following spring for planting into their final positions.

ROOT GRAFTING AND OTHER METHODS

There are one or two minor variations of this basic grafting technique which can be used to advantage in certain instances by the keen amateur grower. Root grafting is quite a simple procedure and can enable a modest quantity of plants to be raised without undue difficulty. If understocks are not available but you have some large plants of Rhododendrons growing in your garden, then dig around them carefully with a fork to reveal some of the larger roots. One or two of these can be carefully removed and cut up into suitable sections about six inches long, each section containing a good supply of side branches and fine fibrous roots. These pieces can then be used as understocks and a scion grafted upon them in the usual manner. If the scion and the root are then plunged in the grafting bench, or better still in a well prepared cold frame in a soil rich in acid humus,

the roots will immediately take hold, unite with the scion, and fair percentages of good plants can be expected.

Tip grafting is another adaptation which was, I believe, first developed by Dr. Yeates down in New Zealand. The need for this arose when scions of new varieties were sent out from England in September, as the English growing season drew to a close, but, of course, on arrival in New Zealand the seasons were reversed, and the Rhododendrons had finished flowering and were commencing active growth. Dr. Yeates found that quite firm scions of well established and ripened wood could be carefully grafted onto actively growing tip shoots on understocks prepared for this purpose. Great care was necessary in the knifemanship, and, of course, the protection of a sweat box was necessary to complete the graft. Union was quite rapid, however, because of the actively growing nature of the soft tip on the understock, and success or failure was apparent in a short time. This same method of tip grafting can be adapted, of course, for the top working of old plants in much the same manner as the orchardist sometimes changes old orchards to new varieties. Scions can be top grafted onto actively growing shoots of large established trees, and these grafts can be protected either by waxing or by wrapping in a polyethylene plastic. This, however, is not likely to be of much immediate value to the average amateur grower.

Budding does not seem to have been very actively explored by commercial growers, and yet I believe it to be a feasible method of propagating Rhododendrons. I recall seeing an old woodsman on a country estate in England back in 1934 attempting to bud Rhododendrons onto established seedlings of *R. ponticum* with quite good success. The buds were inserted towards the end of August, at which time the seedlings were in their second flush of growth, and they seemed to take quite well at that time. This is a simple method of increasing of a new variety, if the technique of budding can be mastered.

All these methods which revolve around the basic principle of grafting have been mentioned because they may be of interest to some, but I do not think that they are necessarily of practical value to the average amateur grower. Because of our knowledge of modern methods of plant propagation, I believe that the most successful method for the amateur to use is propagation by cuttings, which we will now consider.

PROPAGATION BY STEM CUTTINGS

When I came to this country in late 1946 from England, the prop-

agation of Rhododendrons from stem cuttings was practically unknown in that country. However, I quickly found that some work had already been done in America. I read with great interest the methods described by Mr. Nearing and Dr. Connors of the New Jersey Agricultural Experimental Station. Mr. Nearing in particular went to considerable lengths to set up a particular type of frame, facing north with reflected light from a wooden structure erected above the frame. He went into precise details as to the method of constructing the rooting medium. I use the word "constructing" because that is the only adjective which can adequately describe the methods used. Layer upon layer of different materials were carefully placed in the frame until finally the bed was ready to receive the cuttings. I constructed a Nearing frame and used it exactly as directed. While I am bound to agree that Rhododendrons can be rooted in a frame of this kind, I believe that fundamentally the Nearing method goes back to the far more simple problem of the control of water in the rooting medium and particularly in the air immediately around the cuttings. His methods of flooding and maintaining a high level of humidity in the frame are, I believe, the factors which really resulted in the success which he and other growers certainly report by using his techniques. In addition, of course, Mr. Nearing had the patience to wait one, two, and even three years in order to obtain rooted cuttings.

With the stimulus of commercial necessity spurring us on, we commenced tests in New Jersey in 1947, using as our standard the relatively easily rooted 'Roseum Elegans', and, by working on this plant alone for some two or three years, we established a few simple but clear-cut rules which seem to be necessary for the successful rooting of Rhododendron stem cuttings. After we had established these rules, we began to extend and elaborate on them in various ways in an effort to root more difficult varieties, and, as our knowledge grew, we found that we could root more and more varieties with success, until after seven years of careful testing and gradual extension, we were raising Rhododendrons of some 25 named varieties in commercial quantities of somewhat more than 50,000 cuttings per year. Now we do not consider a method successful unless we root at least 50% of the cuttings inserted. This is based upon commercial necessity, and, therefore, the methods which I am about to describe and the results obtained from them are evaluated on this basis. I believe that by using some adaptation of these methods it should be possible to root a few cuttings of almost any variety of Rhododendron, and this perhaps is all that the average amateur would require. The percentage of rooting will

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UPPER LEFT. Good type of cutting wood formed by pinching tips after first flush of growth. UPPER RIGHT. How a cutting is prepared. CENTER LEFT. Making a heavy wound at base of cutting. CENTER RIGHT. Well rooted cuttings lifted from the bench. LOWER LEFT. This rooted cutting had been potted and now has sufficient root development to go into the nursery bed. LOWER RIGHT. Setting potted plants into the nursery bed.

depend entirely upon the inherent characteristics of the plant in question, and this, of course, varies between very wide extremes according to variety. Unfortunately, our efforts had to be confined to the somewhat uninteresting so-called 'iron-clad' group of varieties which were in demand on the eastern side of the Continent, but, from what I have seen of other people's work in Oregon, I am quite sure that the host of beautiful varietes which are grown there can, in most instances, be rooted with even greater ease. Now, let us consider the various factors in the successful rooting of Rhododendron cuttings and see how they mesh one with the other.

TIMING

Timing is particularly important, because, when considering all the points which affect the rooting of Rhododendron cuttings, we find that most of them, excepting only timing, can be controlled to a certain extent. We can control the type of cutting, the wounding, hormone treatment, the medium, humidification, and so on, but the precise time to take the cutting must inevitably vary with local conditions, which differ year by year. The decision must finally depend upon the considered and skillful judgment of the propagator. Because of these inherent difficulties, it is almost impossible to obtain accurate information as to timing on different varieties. In this vast country, growing conditions vary widely, and the condition of the plants with which the grower has to work can, therefore, vary equally as widely, so that the only really valuable information is that which is obtained from work at home. I must, therefore, preface my remarks by saying that the results which I am about to record apply only to the particular varieties named and under the conditions appertaining at the time in southern New Jersey. They can perhaps serve as some indication of what may be the best time to take cuttings of various varieties of Rhododendrons, but they cannot be considered as specific information upon which growers in different parts of the country can expect to base their plans.

We have found that the difference in percentage of rooting can be as much as 50% with only two weeks' difference in the date of taking the cuttings. For instance, 'Ignatius Sargent,' taken on the 16th of August, gave 36% rooting, while cuttings taken from the same plants on the 5th of September gave 74% under identical conditions of treatment. Similar critical timing has come out on many other varieties, but, under our conditions in southern New Jersey, we found that the period from mid-July to late October covers most of them.

Certain varieties which start into early growth in the spring and, therefore, mature early in the summer, can be taken at the end of July. 'Purpureum Elegans' is one, 'Lee's Dark Purple' another. Now, unfortunately, having made this statement, we have at once to qualify it, because, of course, the treatment of the stock plants can affect the timing. If the season has been wet and the plants continue to make active, soft growth, the optimum date may have to be deferred, while another reason which may cause the date to be moved back is that the stock plants may have been pinched after making the first surge of spring growth. If this is done in order to produce a suitable type cutting—see the next paragraph—then it may be necessary to defer the timing from mid-August to mid-September or even later. The importance of timing on what might be considered quite easy varieties cannot be minimized. Take 'Cunningham's White,' for instance; cuttings which were taken on July 11th rooted 100%, whereas those taken on August 10th of the same year rooted only 65%. On 'Lee's Dark Purple,' cuttings taken on July 11th rooted 64%, while similar cuttings taken on August 16th rooted only 32%. It follows, therefore, that the timing must bear a direct relationship to the time that the plants start into growth in the spring and must be governed and finally pin-pointed after having taken into account other factors affecting growth development, such as weather, trimming of the plants, and so on. The actual date at which the cuttings should be taken has to be judged season by season.

TYPE OF CUTTING

Thin cuttings taken from side growths have given consistently higher percentages of rooting. Strong, vigorous, terminal growths are the worst. Cuttings from the under side of large plants rooted very much more readily than cuttings taken from the vigorously growing top. It is possible to produce these thinner side shoots by pinching back after the first flush of growth of the stock plants has been completed. By pinching the terminal bud at this time, lateral buds are forced into development, and although the second surge of growth may be delayed by two or three weeks, the plants then produce relatively short and somewhat thinner growths. Cuttings of this kind root with far greater ease than any other kind, and I would go so far as to say that, if these thinner side shoots cannot be found from the plants in your garden, then defer your first attempt at the rooting of Rhododendron cuttings until you can obtain this thin type of cutting.

Referring back to our preamble on the control of water, it is essential that cuttings be gathered early in the morning when the plant material is fully turgid. We gather our cuttings as early as possible before the sun is up and immediately place them in a cool cellar and dampen them down to keep them cool and moist. We have found that short cuttings of three to four inches in length root more readily than longer ones. If long ones are made and inserted, they tend to root half way up the stem at a point close to the surface of the rooting medium, and the insertion of the long stem seems only to delay the rooting process. There seems to be no obvious advantage in keeping a heel on the base of the cuttings as we have obtained just as good results with or without a heel. The leaves on the individual cuttings are reduced to a maximum of four, unless they are rather small, when perhaps five or six may be kept. In our original tests, we did not halve any of the leaves, but in subsequent tests we have done this and have found that, if sufficient leaf surface is left on the cutting, no harmful results follow. Therefore, if space is limited and the leaves are rather large on the cuttings, by all means, reduce them by 50%. The trimming of the leaves, however, should be done with an extremely sharp knife so that the edges are not macerated but are cut cleanly.

WOUNDING

This is a very important procedure. I do not say that Rhododendron cuttings cannot be rooted without wounding, but we have proved time and again that by carrying out this simple procedure, we greatly increase the speed and total percentage of cuttings rooted. Wounding of cuttings does not seem to be too widely practiced, apart from the time-honored method of splitting Carnation cuttings. I first ran into it in 1946 when on a visit to the Boskoop trial grounds in Holland. We have experimented with a number of different kinds of wounds, but we have found that what we call our "heavy" wound is preferable. The cutting is prepared in the normal way, excessive leaves removed, the base of the stem trimmed to the desired length, and then with a sharp knife a thin slice is removed from the base of the cutting for a distance of about 1½ inches. This slice cuts through the outer cortex tissue and exposes the cambium layer beneath. We believe it best not to cut through the cambium layer if it is possible to gauge the cut thus accurately, but, when unskilled people are operating on large quantities, every variation can be found. The actual depth of the wound, as long as it does not cut the stem in half, seems

to be not too critical. We have found some varieties respond even better to a double wound of this kind, whereby a similar slice is removed from the other side of the stem. We have always considered that the main value of the wound is to allow a much larger area of entry for the hormone treatments which we give immediately. Whether this is scientifically true or not I do not know, but the fact remains that the wounds certainly work. I have no records of treatments of cuttings without wounding, because following my visit to Boskoop I was convinced of the value of this treatment. However, in checking back into the yearly reports of the Boskoop Trial Grounds, I can quote one or two examples which clearly illustrate the value of wounding. Cuttings of Rhododendron 'Catawbiense Grandiflorum' were taken on the 5th of July and lifted on the 12th of October. All had exactly the same treatment in terms of medium, bottom heat, hormone powders, and so on. One group which was wounded gave 87% rooting, while an exactly similar group unwounded gave 20% rooting. The difference on 'Cunningham's White' was even more marked. Cuttings taken on the 6th of July and lifted on the 18th of October showed 100% on the wounded group and 27% on the unwounded group, even although the unwounded group received a hormone treatment twice as strong as the wounded group. Similar results could be quoted over a wide range of varieties. The sum total of these tests is to prove conclusively, I believe, that wounding of Rhododendron cuttings is highly desirable.

HORMONE TREATMENTS

Combined with wounding must be hormone treatments, and here again I am a great believer in the use of these aids to propagation, because I have proven, to my satisfaction at least, that they are highly beneficial when used intelligently. Most of the more readily rooted varieties, of which we might take 'Roseum Elegans' as a standard, will respond to Merck's Hormodin No. 3, which contains 8 milligrams to the gram of indolebutyric acid. This is the strongest commercially available powder, of which the formula is given in this Country, and I prefer to work with known materials that can be integrated into results already available. Merck's No. 3 powder admirably suits the variety 'Roseum Elegans,' and it would appear to be quite adequate for many of the softer types which are grown in the Pacific Northwest. Our first series of tests, however, showed that many varieties of Rhododendrons would not respond to this strength of hormone, and that much stronger treatments were apparently

needed in order to obtain reasonable results. Taking 'Dr. Dresselhuys' as being typical of some of the more difficult varieties to root, the highest percentage that we were able to obtain with Merck's No. 3 powder was 5.3%, a quite hopeless percentage for satisfactory propagation. Our first efforts at rooting this and other difficult varieties was to increase the strength of indolebutyric acid, and we made our own powders at strengths of from 2 to 4 percent in talc, these containing from 20 to 40 milligrams per gram of the active chemical. We found that the 2% strength (20 milligrams to the gram) represented about the optimum strength for most of the varieties which would be considered of medium rooting ability. To quote some results, the variety 'Cynthia' when treated with Hormodin No. 3 rooted 15%, but 83% rooted with 2% IBA. On more readily rooted varieties such as 'Parson's Gloriosum,' the increase due to the stronger powder was still in evidence. With this particular variety, 65% were rooted with Hormodin No. 3, and 90% with the 2% powder. Our standard procedure, therefore, was to take a small quantity of cuttings and treat them with all strengths, and, from this, to determine what appeared to be the best treatment. Subsequent production was then based upon this treatment. As these results began to accumulate, however, they showed that many varieties required still stronger hormone treatments in order to be stimulated into the production of roots. In our testing, we centered now upon the variety 'Dr. Dresselhuys,' because it is a so-called red-flowered variety, it was in keen demand, and it had resisted our efforts to root cuttings.

We tested a wide range of chemicals, and from them all selected one which has the rather appalling name of 245 Trichlorophenoxy Alpha Propionic Acid (245-TP). We found that this material, mixed at a 1% strength (10 milligrams to the gram) gave us rooting percentages of 80, 90, and 90 from groups of cuttings taken on the 6th of August, the 23rd of August, and the 17th of September. Following this initial success, we went into large scale production, putting in considerable quantities of this and other more difficult varieties, such as 'Edward S. Rand,' and proved conclusively that, under our conditions in New Jersey, 70% to 90% well rooted cuttings could be obtained by the use of this 245 TP, provided other conditions were right. To sum up, therefore, insofar as my personal experience goes, average varieties of Rhododendrons will respond to Hormodin No. 3. Somewhat more difficult varieties will require 2% indolebutyric acid, while the extremely difficult varieties will respond to 245 TP at 1% strength. However, it should be repeated again that

the use of these chemicals will not in any way affect the need for careful attention to other aspects of propagation, procedures which have to be controlled and directed as precisely and as carefully as can be whether hormones are used or not.

MEDIUM AND BOTTOM HEAT

We have tested a wide variety of mediums but have centered finally on a mixture of 90% acid peat, pH 4 to 4.5, and 10% clean, sharp sand. I am not sure that the sand is necessary, but it seems to facilitate the removal of the cuttings when rooted. Bottom heat we maintain at a steady 70 to 75 degrees. There seems to be a definite value in reducing the temperature after the cuttings have been in the bench some time. Cuttings taken in August will respond to a high temperature, but if they have not rooted in three months, then they are more likely to do so if the bottom temperature is dropped to 60 degrees. Associated with the maintenance of bottom heat, the question of top heat or lack of it should be briefly considered. From all that I have seen and from our own experience, I believe that best results can be obtained by maintaining top temperatures considerably lower than bench temperatures, and, in fact, I would go so far as to say that quite wide differences in bench and air temperature are advantageous rather than the reverse. This means that the use of heating cables for the maintenance of bench temperatures is highly satisfactory.

HUMIDIFICATION

This is another of the important factors in the successful rooting of Rhododendron cuttings. The difference between cuttings which are rooted under high humidity and those which are rooted under normal greenhouse conditions, no matter how carefully they may be controlled, is extreme. Let me again quote a few specific figures. Cuttings of the Rhododendron 'America' taken on July 11th and maintained in a greenhouse without humidification control gave 16% rooting, while cuttings of the same variety taken on August 16th under controlled humidification gave 80% rooting. The maintenance of a highly humid condition need not automatically require the use of complicated equipment. A number of growers are finding that conditions of high humidity can be maintained immediately around their cuttings simply by covering the whole of the cutting bench or flat with a sheet of polyethylene plastic. One grower from Oregon reported to me some time ago that he inserted his cuttings in the

bench, flooded them in well, immediately covered the whole bench carefully with this sheet of plastic so that no water vapor or air could escape and then left them alone. Heavy condensation appeared on the plastic sheet and then dropped back to the bench, and, although the leaves of the cuttings were kept perpetually moist, no harm resulted and excellent rooting followed. I have attempted to root Rhododendron cuttings under an outdoor constant mist, but this has not proven to be satisfactory. I believe the reason has been that the application of large quantities of water lowered the temperature of the rooting medium, and this, in turn, slowed up rooting processes. I believe that, if some form of humidity control using water atomizing jets is used, an intermittant control such as a percentage timer would be desirable to reduce the actual application of free water to the minimum. Whatever system is used, whether it be nothing more than a simple plastic sheet, a single jet in a greenhouse, a fan blowing through a blanket of wet burlap to distribute a fine mist, or a constructed humidifier, the maintenance of an extremely high level of relative humidity in the atmosphere immediately around Rhododendron cuttings is highly beneficial.

Maintenance of high humidity has a definite bearing upon the permissible light intensity in the propagating houses. I believe that this in turn has a very definite bearing upon the results obtained, and we try to keep the maximum light intensity consistent with proper control of air temperature. Humidification, air temperature, and light are all interconnected, and all require very careful watching to maintain a proper balance. Referring back to air temperature, if cuttings are taken in August and September, then it may be that quite high air temperatures can be experienced in the frame or greenhouse. Some means of controlling this must be adopted. We have tried to keep our air temperature at a maximum of 85° F. by running cold water down the outside of the greenhouse and running our fog system throughout the day inside.

ROOTING AND THE TREATING OF UNROOTED CUTTINGS

Rhododendron cuttings rapidly produce a pad of callous but then apparently remain dormant for some time. I cannot stress too strongly the need for patience, particularly with the red-flowering and slow-rooting types, which sometimes require as long as six to eight months to produce a proper ball of roots. Speed of rooting will vary according to varieties, and those which are slow must be treated with patience. Easily rooted varieties, such as 'Roseum Elegans,' will usual-

ly be fit to remove from the propagation bench in about twelve to fourteen weeks, and once a good proportion of cuttings are rooted, there should be no delay in the lifting. The cuttings will develop best if potted on as soon as may be, while the unrooted or lightly rooted cuttings can be returned to the bench to develop further. This movement of unrooted or lightly rooted cuttings appears to be advantageous to them, because in many instances they immediately start to form active roots as soon as they have been moved. I believe that this effect may be due to the stirring of the propagating medium and the aeration of it. The peat tends to pack down, and after three or four months the amount of aeration is apparently not sufficient to induce active rooting. We have also found that it sometimes pays to re-insert the unrooted cuttings in fresh medium. Many cuttings will start to root, producing a small bunch of stunted, fuzzy roots, obviously abnormal. If the medium is changed and the cuttings inserted in the fresh peat and sand mixture, they will at once commence to produce normal roots and can be potted on in a short time.

POTTING

Our cuttings are potted into 3" pots, using a suitable acid peat mixture, and are returned to the houses from whence they just came. At the time of potting the terminal bud is removed, because by so doing we induce side buds at the apex of the cutting to swell and get ready for active growth next spring. By pinching at the time the cuttings are potted, which is usually sometime in November or December, these buds develop through the winter and burst into normal growth at the right time in the spring. If the pinching is delayed until spring, development of the buds is three to four weeks late, and this amount of growing time is, therefore, lost. Once the cuttings are well established in the pots, they are hardened off and finally removed to frames and plunged in a bed of peat, where they remain through the winter.

CUTTINGS IN A COLD FRAME

While the methods described above are those which have been used in a conventional sash type greenhouse, they can be adapted for use in a good tight cold frame with equal success. Here the bottom heat can be satisfactorily supplied by an electric heating cable, and the humidity will, of course, have to be maintained by frequent daily syringing. With the regular application of water in this way to maintain a highly humid condition, the only point to watch is the provi-

DATA ON ROOTING OF RHODODENDRONS FROM CUTTINGS

Variety	Approximate Best Time to Take Cuttings	Best Hormone Treatment	Best Percentage Of Well-rooted Cuttings
America	Mid-Aug.	Merck's No. 3	80%
America	Late Aug. to early Sept.	IBA 2%	64%
Album Elegans	Mid-July	Merck's No. 3	70%
Boule de Neige	Late July	IBA 2%	46%
Catawbiense Album	Mid-Nov.	Merck's No. 3	86%
Catawbiense Boursault	Mid-Aug. to mid-Sept.	IBA 2%	100%
Catawbiense Grandiflorum	Mid-Oct. to Mid-Nov.	Merck's No. 3	97%
Charles Bagley	Last week in Sept.	IBA 2%	65%
Chionoides	Late Sept. to early Oct.	Merck's No. 3	84%
Caractacus	August	IBA 2% or Merck's No. 3	74%
Cunningham's White	Mid-July	Merck's No. 3	100%
Cynthia	Nov. 1 to 15	IBA 2%	86%
Dr. Dresselhuys	Mid-Aug. to early Sept.	2,4,5-TP 1%	90%
Dr. Torrey	Nov. 1	IBA 2%	60%
Dr. Torrey	Mid-Sept.	IBA 2%	62%
English Roseum	August	IBA 2%	76%
Edward S. Rand	Mid-Sept. to Mid-Oct.	2,4,5-TP 1%	100%
Everestianum	Mid-Sept.	IBA 3%	22%
Fastuosum Plenum	Mid-Oct. to Nov.	IBA 2%	96%
Ignatius Sargent	Mid-Sept.	IBA 2%	74%
Kate Waterer	Mid-Oct.	IBA 4%	97%
John Walter	Nov.	IBA 2%	93%
Lee's Dark Purple	July 7-14	Merck's No. 3	64%
Mme. Carvalho	Mid-Sept.	IBA 2%	62%
Mme. Masson	Mid-Sept.	IBA 2%	85%
Parson's Gloriosum	Early Sept.	IBA 2%	90%
Purpureum Elegans	Early July	Merck's No. 3 or IBA 2%	70%
Roseum Elegans	Mid-Aug. to Late Nov.	Merck's No. 3 early or IBA 2% late	80-95%
Sappho	Mid-Sept.	IBA 2%	60%

sion of excellent sub-drainage so that no water is allowed to collect in the rooting medium. Given this good drainage and if a moderate amount of bottom heat is supplied through an electric heating cable, then quite good results can be expected. Cuttings can be taken at the times stated above, but there is little value in attempting to lift and pot on the cuttings from the cold frame. Once they have rooted, they may as well be protected and allowed to remain through the winter months and finally lifted from the frame for planting early in the spring.

I have dealt at some length with the propagation of Rhododendrons from stem cuttings because I believe it to be the most satisfactory method for the average grower to use, whether he be commercial or amateur. The combined efforts of many workers through the past ten years have established the basic principles which can provide satisfactory results, and there seems no reason, therefore, why propagation in this manner should not be generally acceptable.

LEAF BUD CUTTINGS

In considering propagation from cuttings, you will note that the mention of leaf bud cuttings has been conspicuous by its absence. Leaf bud cuttings can certainly be rooted. Many growers are doing it well, and we have rooted them too, but, once rooted, they have a tendency to remain dormant, and it is sometimes extremely difficult to break the one bud into active growth. I have kept plants for as long as 21 months before dormancy has been broken, and delays of this kind are unreasonable. However, the method does have certain advantages for the amateur grower wishing to produce a few plants only, or for the propagator who may wish to rapidly increase a new variety, or a variety of which he has but limited stock. Generally speaking, all methods described above for the rooting of stem cuttings apply equally well to the bud cuttings, excepting only that it is not necessary to wound such cuttings. The cutting consists of a single bud with a bit of the stem and with the single leaf attached. The apex of the stem can be divided into three or four such cuttings if there is a suitable cluster of buds at the top. The cuttings should be treated immediately with a suitable hormone powder and inserted in the rooting medium so that the bud and the petiole of the leaf are buried. However, if possible, the blade of the leaf should not be buried, and the cutting should be inserted in such a manner that the leaf blades are held erect or nearly so above the rooting medium. These leaf bud cuttings will root in much the same manner as the stem

cuttings, and, once rooted, can be potted on and treated as individual plants. The main problem is in the breaking of the dormancy of the one bud, upon which the development of the new plant depends. Patience and, perhaps in certain instances, extremely high temperatures of 85 to 90 degrees may be needed to induce development of this one bud.

LAYERING

A review of Rhododendron propagation would not be complete without mention of layering, because this is a particularly suitable method for the average amateur to use. No extensive equipment or preparations are needed.

In commercial nurseries, plants which are to be layered are usually lifted and brought into a special layering area. These plants are set in at an angle so that all shoots can be brought into contact with the ground. In a garden, such drastic treatment of the mother plants is not necessary. However, it must be obvious that for normal layering it must be possible to bring the terminal shoot on a branch in

Seabrook Farms Photo

A successful graft showing callus growth where union has occurred.

contact with the soil. The condition of the soil into which the layers are to be placed is of some importance, and it usually is worked up by the addition of sand and peat until an open, well-worked, peaty soil is available as a bed, perhaps some six inches deep, around the base of the plant to be layered. Branches suitably placed on the parent plant are then brought down to this prepared bed and each individual shoot is carefully pegged down. The point of pegging is usually about six inches behind the growing tip. Additional soil is then brought over the main stem and peg, leaving the growing point and the final tuft of leaves clear of the ground. The stem is sharply bent under the peg, the peg being fixed at the bottom of the U thus formed. The bending of the stem in this way encourages the formation of roots at this point. It is also a common practice to slightly slit the stem on the outside at the bottom of the bend, which also helps in the vigorous formation of roots. Layering in this way is usually done during the month of August. Early in October the plants are carefully mulched with fallen leaves or shredded peat moss as an added protection through the coming winter. If the weather is likely to be unduly severe, a top covering of Pine or Spruce branches can be laid over the layers to protect them from the weather. The following spring, this top covering is removed, the mulch of peat or leaves disturbed and freshened up, but apart from this no further work is necessary. The layers must be maintained in a moist medium throughout the following summer in order to encourage good root development. Water, therefore, is essential and must be provided in times of drought. By the end of the following year, most of the layers will have rooted, but it is unwise to remove them from the parent plant in the fall. The layers should therefore be protected again this second winter in much the same manner as was done the first time, and by the following spring they will have developed an extremely vigorous and complete root system which will enable them to be removed from the mother plants and set out into prepared beds without difficulty. This is a somewhat slow but entirely satisfactory method of propagation, which is eminently suitable for the production of limited quantities of plants in an enthusiast's garden.

AIR LAYERING

An adaptation of the standard layering method has recently received some publicity, and that is air layering. The method is, of course, not new, for it was practiced some five thousand years ago by the Chinese. The only thing that is new is the application of mod-

ern plastics to the protection of the air layer while it is rooting. In air layering, a suitable stem on the mother plant is selected for propagation and a small strip of bark removed, about a quarter of an inch wide, right around the stem. This wound is immediately treated with a suitable hormone powder, such as Merck's No. 3, or 2% IBA. The wounded area is then completely covered with a ball of packed moist Sphagnum moss, about the size of a clenched fist. This ball of moss is in turn covered with a sheet of polyethylene plastic, which is tightly fixed to the stem both above and below the moss ball. The plastic sheet completely eliminates water loss from the Sphagnum moss ball, and under the moist humid conditions inside the stem will in many instances produce roots from the point of the wound. Early April is considered to be a good time for the application of air layers and, in most instances, these layers can be removed from the parent plant about twelve months from the time they were applied. Special kits of plastic sheeting are available from good garden stores, or alternatively, any of the plastic sheeting now used for covering windows and available from your local hardware store, can be cut into a suitable square and used for this purpose. This method is an interesting variation and again is quite satisfactory for the production of modest quantities in the garden of a Rhododendron grower. It is not a commercially suitable method because the percentages which are usually obtained, on Rhododendrons in particular, are not high. If you were to apply ten air layers in the manner described, you are likely to obtain not more than three or four well rooted plants, the percentage, of course, depending upon the variety.

AFTER TREATMENT OF THE YOUNG PLANTS

Having now covered most of the generally used methods of propagation, it might be of interest to briefly discuss the subsequent handling of young plants for the first two growing seasons. Whether the plants be propagated from seed, grafts, stem, or leaf bud cuttings, air or ground layers, there comes a time when the plants have to be set out into prepared beds. Treatment of the soil with a good dressing of 3 to 4 inches of peat is advisable and, of course, the pH of the top soil should be checked to insure that it is within the proper range of 4 to 5.5. If such a dressing of peat is well mixed into the top 6 inches of soil, the resulting mixture will be about a 50-50 mixture of top soil and peat, an excellent growing medium for the young Rhododendrons. Early planting is essential for optimum develop-

ment the first year. Rhododendrons commence root growth far earlier in the spring than is generally realized, and even under conditions of low temperatures and inclement weather roots will be actively developing in the pots, flats or other containers where the young plants may be. If it is possible to prepare land in the fall, so that all that has to be done is a light raking and preparation for planting early in the spring, then I would suggest setting out the young plants as early as the ground can be worked. Such early planting, when the soil is cool, will allow the young plant to become rapidly established and the root system will become thoroughly attached to the soil before warm summer weather appears.

I mentioned earlier the importance of pinching the terminal bud on rooted cuttings at the time they are lifted for potting in the fall. The comment applies equally, of course, to any form of Rhododendron plant, and if this small attention can be given to all plants, no matter whether they be layers, seedlings, cuttings, or grafts, development of a fine branched system of shoots will be more positive and more rapid the following year: This, of course, will not be true of leaf bud cuttings, which must make initial growth from the one bud before the terminal shoot can be pinched back to induce the required branching. Once growth is complete on these shoots, which will probably be sometime in June, the terminal bud can again be removed from each of them and the second set of growth which follows will once again be branched. The final result is to produce a fine 10 to 12-inch, or in some cases a 12 to 15-inch plant, with a well branched system of stems, which is the basis of a fine bushy Rhododendron. This plant, if left undisturbed in the beds in the second year, will grow 15 to 18 inches in height and should bud up strongly. A plant of this type is, of course, entirely suitable to move from the specially prepared nursery beds into final planting locations in any part of the garden or nursery.

1. Audus. Plant Growth Substances. England.
2. Avery, Geo. and Elizabeth Johnson. Hormones and Horticulture, McGraw Hill.
3. Pearse, H. L. Growth Substances and their Practical Importance in Horticulture. Commonwealth Bureau of Horticultural and Plantation Crops, Aberystwyth, Wales.
4. Thimann and Behnke. The Use of Auxins in the Rooting of Woody Cuttings. Harvard Forest, Petersham, Mass.

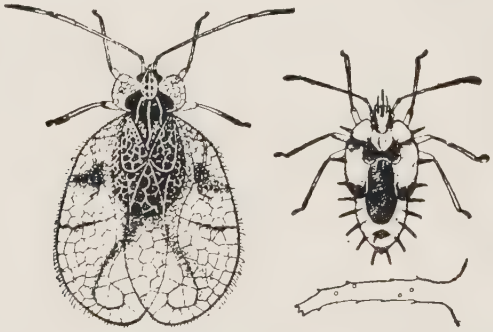
(Plastic ice box dishes for use in seed germination were discussed by Dr. F. J. Nisbet in the A.R.S. Bulletin for October, 1951. Mr. Halfdan Lem, in the 1946 A.R.S. Yearbook, page 17, describes the method of top grafting into growing tips.—EDITOR)

INSECT PESTS OF RHODODENDRONS AND AZALEAS

DR. E. P. BREAKEY

Like most plants, Rhododendrons and Azaleas are often injured by insects and related pests. Fortunately, they are relatively trouble-free, requiring nowhere near the attention to pest control some other garden plants require—the Rose, for example, though it may be most desirable in all other respects. It is advisable to be forewarned and prepared, however, and it is hoped the information compiled here will assist those who do have an insect control problem. The growing of Rhododendrons and Azaleas should be and can be an enjoyable avocation.

Technically, Azaleas are also Rhododendrons. However, in commerce and to most gardeners Azaleas belong in a separate class.



Rhododendron lace bug, adult and nymph. Insects and Diseases of Ornamental Trees and Shrubs, Felt and Rankin, Copyright 1932. The Macmillan Co. (By permission)

Moreover, Azaleas differ considerably in their cultural requirements and in some instances the insect pests of Azaleas are not often injurious to Rhododendrons and vice versa. For this reason it is desirable to discuss the Rhododendron lace bug separately from the Azalea lace bug, though the control for both is the same.

Before considering the control of specific pests, a few general observations may help us in evaluating the problems as they arise.

Plants grown in considerable shade and in soil with adequate humus and mulch seldom suffer extensive damage from such insects as lace bugs. It has also been noted that such plants usually escape appreciable injury by the Japanese beetle in those areas where the insect is presently established. Moisture and shade also tend to discourage spider mites. The Azalea whitefly, *Aleyrodes azaleae* B. & M., injures *Rhododendron mucronatum* and related species and their derivatives but is rarely injurious to the Kurumes. A heavy infestation may spill over into other nearby species and varieties, but the insects probably will not breed on them. The Rhododendron whitefly, *Dialeurodes chittendeni* Laing, is restricted primarily to those species and varieties whose leaves are relatively free of scales or tomentum on the under surfaces. Leaves with thick or leathery epidermis are also partially or wholly immune to attack.

RHODODENDRON LACE BUG

The Rhododendron lace bug, *Stephanitis rhododendri* Horv., may be found on the undersides of the leaves of Rhododendrons, Azaleas and Mountain Laurel. It belongs to the family *Tingidae*, whose members are called lace bugs because of their gauze-like, reticulated wings, the peculiar hood-like structure over the head, and the broad lateral expansions of the prothorax, suggestive of an exaggerated Elizabethan collar. The nymphs are relatively small and spiny. It is a native of the eastern United States and was introduced from there into Europe and the Pacific Northwest. It was and still is a much more serious pest in the east and south than it is in the Pacific Northwest.

Eggs are inserted in the lower surfaces of the leaves along the midribs and larger veins in late summer and early fall. Nymphs hatch from these eggs the following spring and become fully grown by June or early July. A second generation of adults often appears in late summer or early fall.

Injury is caused by the insects sucking the plant juices from the undersides of the leaves. When feeding they remove or destroy the chlorophyll, causing the leaves to take on a mottled grayish discoloration. Later these leaves may turn brown and leathery and cease to grow. The lower surfaces of infested leaves are further disfigured with numerous, small, dark, varnish-like spots of excrement and sometimes with cast nymphal skins.

AZALEA LACE BUG

The Azalea lace bug, *Stephanitis pyroides* Scott, apparently does not occur in the Pacific Northwest. It is one of the worst pests of Azaleas in other sections where these plants are grown and prized and will also attack Rhododendrons and Mountain Laurel. Its life history is very similar to that of the Rhododendron lace bug, and since the eggs are laid in the bark of new growth and in the midribs of the leaves, there is always danger of introducing it. Those who bring plants into the Pacific Northwest from other sections would do well to pick off and burn all of last season's leaves as an added precaution against introducing it.

Control

Lace bugs are readily controlled by the timely application of a good contact insecticide. One pint of nicotine sulphate 40 per cent, plus 3 pounds of soap, in 100 gallons of water is an old-time spray for killing lace bugs. In smaller amounts this would be 1 teaspoonful in each gallon of soapy water. Unfortunately, for best results nicotine must be used when the temperature is 70° F. or higher, a condition seldom prevailing in the Pacific Northwest when control measures must be used. Lindane is one of the best of the new insecticides for general purpose spraying and the results do not seem to be influenced by the prevailing temperatures, as are those obtained from the use of nicotine. Use at the rate of 1 pound of the 25 per cent wettable spray powder in 100 gallons of water, or 1 teaspoonful in each gallon. An effective spray that will not leave an unsightly residue on the foliage can be prepared from DDT in the emulsifiable form. Use 1 quart of the 25 per cent emulsifiable liquid in 100 gallons of water, or 2 teaspoonsful in each gallon. Malathion is one of the most effective of the new insecticides and its use may not encourage the development of a spider mite population as DDT may. Use 1 pound of the 25 per cent wettable spray powder in 100 gallons of water, or 1 teaspoonful in each gallon.

The application of the spray should be timed to kill the nymphs before they have developed into adults and have laid eggs, i.e., about the middle of May in most areas. It is usually advisable to make a second application about a week or 10 days after the first, particularly where the foliage is dense. Spray thoroughly and direct the spray upward against the lower surfaces of the leaves.

RHODODENDRON WHITEFLY

The Rhododendron whitefly, *Dialeurodes chittendeni* Laing, is another insect found on the undersides of the leaves of Rhododendrons. These small moth-like insects are related to the scale insects. Like the scale insects, the immature stages are sedentary, with the exception of the newly hatched larvae, which move about until they begin feeding. Adults of both sexes are winged, however, whereas only the male scale insect develops wings. The adults are quite small. measuring about 1/10th of an inch across the fully expanded wings.

In 1933 the insect was found in Seattle on Rhododendrons that had been imported from England. This chance discovery prompted a survey of the Puget Sound country and disclosed well established populations in Seattle and Tacoma, Washington, in the Fraser River Valley east of Vancouver, British Columbia, and on Vancouver Island near Victoria. It should be noted, however, that the insect has not been a serious problem in this area.

There is but one generation each year in the Pacific Northwest. The rather large eggs are laid on the undersides of the new leaves during the months of May, June and July. Development during the winter months is very slow, and second- and third-stage larvae are present in about equal numbers. A few pupae may be found as early as November, but the peak development of this stage occurs in April and May.

The insects are found on the undersides of the terminal leaves, where the larvae feed by sucking the plant juices. When present in numbers, the feeding of the larvae causes a yellowing and mottling of the leaves. In some varieties this is accompanied by a curling of the leaf margins. The rate of development of the population is so slow that feeding is not deleterious to leaf growth or appearance until spring. The development of the third-stage larvae is rapid, however, and the consumption of plant juices is sufficient to give the leaves a mottled appearance. Considerable loss in ornamental value of the plant also results from the growth of sooty mold fungus on the lower leaves which catch the honey dew dropped by the larvae above them.

AZALEA WHITEFLY

The Azalea whitefly, *Aleyrodes azaleae* B. & M., is another insect pest that apparently does not occur in the Pacific Northwest. It is

very simliar to the Rhododendron whitefly in appearance and feeding habits. It is not a major pest of Azaleas in those areas where it does occur, for it may infest only a few bushes even in extensive plantings, being limited apparently to *Rhododendron mucronatum* and related species and their progeny. The Kurumes are seldom injured.

CONTROL

The timely application of an oil spray, prepared to contain 2 per cent of a summer oil emulsion, is very effective in destroying the larvae and pupae of the whitefly and is not injurious to the host plants. Adult whiteflies are quite susceptible to nicotine and the population can be reduced during the time they are flying by the application of a nicotine spray. Nicotine sprays are not effective against the larvae and pupae, however. Lindane, DDT and malathion are some of the new insecticides that have given good results to date (see under lace bugs for formulae). Sprays for the control of whiteflies can be applied at almost any time of the year, but early in the fall probably is the best period. The terminal leaves are still erect, making effective spraying easier, and the whitefly larvae have not developed to a point where their feeding has done serious injury.

ROOT WEEVIL

The root weevils are probably the most important insect pests attacking Rhododendrons and Azaleas in the Pacific Northwest and are also a serious problem in other parts of the country where these plants are grown. They destroy many valuable plants each season and usually belong to one of three species. They are known as the strawberry root weevil, *Brachyrhinus ovatus* (L.); the rough strawberry weevil, *B. rughostriatus* (Goeze); and the black vine weevil, *B. sulcatus* (Fab.). Adults and larval forms are similar in appearance except for size.

The adult strawberry root weevil is about 1/5-inch long and varies from black to brown in color. The rough strawberry root weevil is about 1/4-inch in length. It is usually an even dark brown in color, The black vine weevil is about 2/5-inch in length, black in color and often marked with small flecks of yellow or white. There are several other kinds of root weevils which are sometimes injurious. Ordinarily they are not numerous and can be controlled in the same manner as the strawberry root weevil.

The life histories of all root weevils are somewhat similar. Most

UPPER LEFT. Azalea leaf miner. Leaves folded by larvae. UPPER RIGHT. Rhododendron bud moth. Larva in bud. Both photos by C. F. Doucette. LOWER LEFT. Rhododendron whitefly. Adults congregating on new leaves. LOWER RIGHT. Rhododendron whitefly, adults. Both photos from U.S.D.A. Circular 429, 1937.

of them pass the winter as white to pinkish-colored legless grubs in the soil around the roots of the host plants. In the milder sections, however, some adult weevils overwinter around the bases of the plants. The overwintering adults usually become active during the latter part of March or the first part of April.

BLACK VINE WEEVIL

The black vine weevil, *Brachyrhinus sulcatus* (Fab.), is probably the most important of the root weevils known to attack Rhododendrons. The first record of injury to cultivated plants by larvae and adults of the black vine weevil was made in Germany in 1834. Since then records of injury to economic plants have been appearing with increasing frequency in Europe, England, Ireland, the United States, Canada and Australia.

The black vine weevil is typical of the group. Newly emerged adults are glistening black in color. The hard wing covers or elytra are marked with longitudinal furrows or striae. Most of the damage is done by the larvae.

Black vine weevils may pass the winter either as hibernating adults or as larvae in the soil. Apparently, most of them overwinter as larvae and complete their development and pupate late in May and in June. The majority of the adults appear early in July, though certain retarded individuals may appear much later. A considerable number are known to emerge in September and some of these may live through the winter. After feeding from three to six weeks, the beetles begin to lay eggs. These are dropped aimlessly in the soil or litter under the host plants. There is but one generation each year.

INJURY

Plants infested with root weevils may be girdled and killed outright or take on a stunted appearance. The small grubs feed entirely on the rootlets. Later they also feed on the larger roots and even on the crowns or stems of heavily infested plants. Adults feed on the leaves and bark, but the total damage done is not considered serious as compared to that of the larvae or grubs.

The rounded notches that one often finds cut in the margins of Rhododendron leaves are made by black vine weevils while feeding. Feeding is done at night or on heavily overcast days. Older larvae will completely girdle the trunks just under the surface of the soil,

killing plants as old as three years or older. The foliage of girdled Azaleas will often turn red prematurely.

CONTROL

Poison bait has been the standard recommendation for the control of root weevils. These baits should contain dried apples or other fruits and sodium fluosilicate. Spraying the foliage with a stomach poison such as lead arsenate is not effective since the beetles are not heavy feeders and will not get sufficient poison to kill them.

BAITS

The first application of the bait should be made during the first half of April to kill overwintered adults. Most weevils emerge from the ground during the latter part of May and the month of June. This period may vary slightly from year to year and with localities but usually coincides with the development of the red coloring incident to the ripening of the first strawberries. The strawberry root weevil is first to appear and is followed in about one week by the rough strawberry root weevil.

The black vine weevil is last to appear. It has been found in numbers the first week in July, a period corresponding to the end of the strawberry harvest. Another period of emergence occurs early in September. These late-comers overwinter as adults. They may lay some eggs before the weather gets cold, finishing their egg-laying the following spring. Scatter the bait among the plants where the weevils will find it. The number of bait applications will vary, depending on how soon the weevils appear in the spring and the occurrence of rains. If it rains soon after the bait is applied, the treatment should be repeated.

NEW INSECTICIDES

It has been found that root weevils can be controlled by treating the soil under and around the plants with either chlordane or aldrin. Treating the soil with one of these insecticides is a preventive and safeguard against injury and not a cure that will rescue injured plants. The insecticides can be applied either as dusts or sprays, preferably in April or early May. Aldrin is available in a 2½ per cent dust and chlordane in a 5 per cent dust. Apply one of these at the rate of 1 pound of the prepared dust to each 200 square

feet of soil surface. Rake or cultivate the dust into the soil to a depth of several inches. In newly prepared beds, work the insecticide into the soil thoroughly to a depth of 6 to 8 inches before setting the plants.

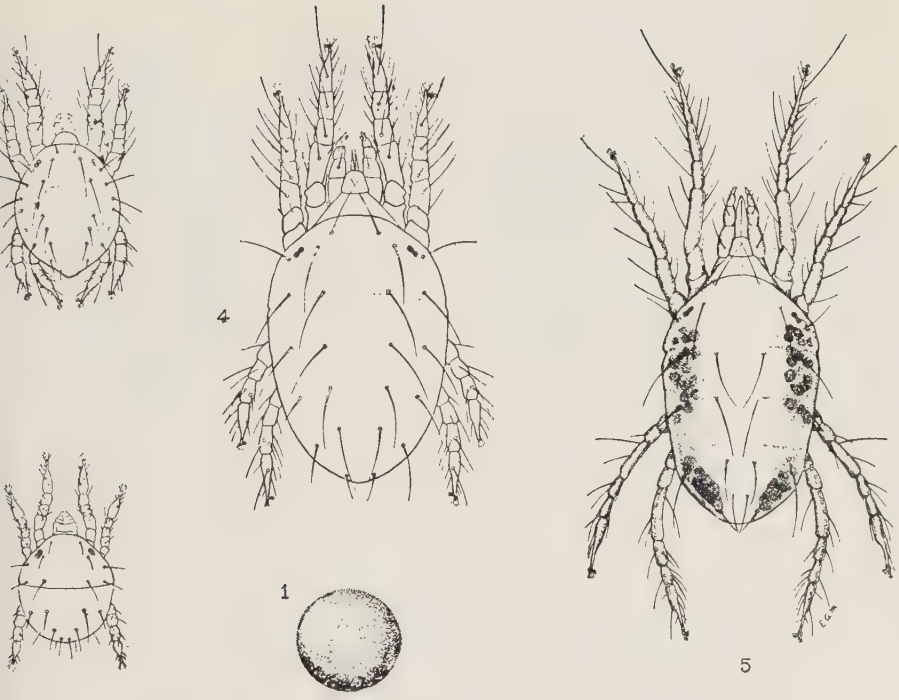
Perhaps a simpler method is to obtain a wettable spray powder containing the insecticide. Aldrin is available as a 25 per cent wettable spray powder and chlordane as a 50 per cent wettable powder. Both can be had in the emulsifiable form also, the concentrates containing approximately the same percentages of the insecticides as the wettable powders. Stir 1 tablespoonful of the wettable powder or emulsion into a 2½ gallon sprinkling can full of water and sprinkle over the plants and soil in the beds until both are thoroughly wet. Note that chlordane is used at twice the concentration of aldrin. Plantings treated in this way should be safe for at least two years. In badly infested areas it is also advisable to spray the lawn and shrubbery around the Rhododendron and Azalea plantings.

ASIATIC BEETLES

The Japanese beetle, *Popillia japonica* Newm., and the brown garden beetle, *Autoserica castanea* Arrow, feed upon the foliage, eating irregular holes in it. Fortunately, neither are known to be present in the west. Japanese beetles are about ⅜-inch long, bright metallic green in color with bronze wings. They are active during the day and are often present in considerable numbers. Brown garden beetles are about ¼-inch long and of velvety chestnut-brown in color. They are active at night, hiding among the trash and rubbish on the ground during the day.

CONTROL

Both of these beetles may be prevented from feeding upon Rhododendrons and Azaleas by keeping the foliage covered with a stomach poison such as DDT from the first of July until the middle of August. Unfortunately, a DDT spray prepared from the wettable spray powder may leave an unsightly residue. Many of the new insecticides can be obtained in the emulsifiable form and would doubtless be preferable since they would not leave a noticeable residue. DDT, chlordane, and aldrin are available in emulsifiable concentrates and are stable enough to provide a protective covering for several weeks. Use according to the manufacturer's directions.



Two spotted mite: 1, the egg; 2, newly hatched larva; 3, recently molted protonymph; 4, mature deutonymph; 5, adult female. E. A. McGregor, U. S. D. A. Farmers' Bulletin 831, 1954.

AZALEA OR RHODODENDRON STEM BORER

The stem borer is the larva of a beetle, *Obera myops* Hald. that girdles the tips of Azaleas, Rhododendrons, and Mountain Laurel in the east. The beetle places an egg below the girdle and the larva that hatches from the egg bores downward toward the crown of the plant, expelling frass from holes cut at intervals through the stem. The yellowish larva is nearly one inch long when fully grown. After constructing a pupal chamber in the crown of the plant just below the surface of the soil, the larva nearly cuts off the stem several inches above the ground line. Such weakened stems are easily broken off by the wind or by the gardener when working among the plants. Pupation takes place in the spring and the beetles emerge in June.

FIG. 1.
Brachyrhinus ovatus (L.), adult female.

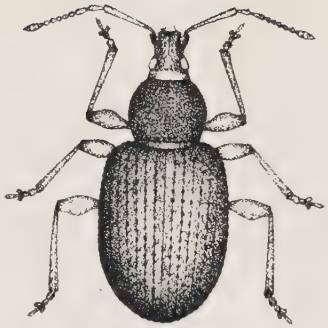


FIG. 2. *Brachyrhinus rugosostriatus* (Goeze), adult female.

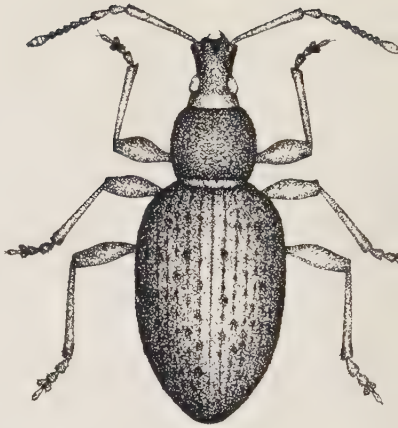


FIG. 3. *Brachyrhinus sulcatus* (Fabr.), adult fema

Root weevils. Adults. Knowlton and James, Proceedings, Utah Academy of emy of Sciences, Arts and Letters, XVIII, 1941.

CONTROL

Dead or dying tips noticed in summer or early fall should be cut out and destroyed. Cut below the point reached by the larva and immediately burn all twigs so removed.

RHODODENDRON BUD MOTH

The Rhododendron bud moth, *Eucordylea huntella* Keifer, injures the flower buds of the native Rhododendron, *Rhododendron macrophyllum* Don, along the west coast. The buds are killed and eaten by the pinkish-white larvae of a small moth. The larva partly girdles the stem at the base of the bud before eating its way up inside the bud. Infested buds die and turn brown in color. Moths appear in April and May and buds containing small larvae have been found in September.

CONTROL

Potentially, this insect could be a serious pest of Rhododendrons. At the present time it seems to be confined to the native Rhododendron along the coast and is apparently heavily parasitized. There are reports of some damage to plantings in the Portland area. Injured buds can be detected during the winter months and early spring. The alert grower should watch for these and remove and destroy them immediately before the larvae can escape.

RHODODENDRON LEAF MINERS

Two leaf miners are present on the west coast, neither of which appears to be a serious pest of Rhododendrons.

The larvae of the moth *Gracilaria ferruginella* Braun make tentiform mines on the undersides of the leaves of Rhododendrons and roll the tips into cones throughout California.

The larvae of the moth *Lyonetia candida* Braun form winding mines ending in large blotches on the leaves of Rhododendrons in California, Oregon and Washington. Controls that are effective against the Azalea leaf miner should be effective against these insects.

SCALE INSECTS

Two scale insects are known to be injurious to Azaleas in the east, from Maryland southward. There have been instances when these pests have been extremely destructive.

One of these is the Azalea bark scale or mealy bug, *Eriococcus azaleae* Comst. This mealy bug overwinters in the south in the nymphal stage and may do the same in the more northern limits of its distribution. Eggs are deposited in a cottony sac from which the young emerge on hatching. The young crawlers disperse over the plant, attaching themselves to the twigs where they remain for the rest of their lives. As the nymphs grow they produce long waxy filaments that partially cover their bodies. On maturing, these filaments become matted and form the cottony sac in which the eggs are laid. These sacs will remain on the plant for some time and help give it an unsightly appearance. Infested plants become unthrifty and this condition together with the accumulation of dirt and old egg sacs rapidly destroys their ornamental value.

Pulvinaria ericicola McC. is the other scale insect that attacks Azaleas in the east. It was described from specimens collected from the native Azalea, *Rhododendron nudiflorum*, and has also been taken on *R. viscosum* in the woods and on various cultivated hybrids. The insect is usually found near the base of the plant, but if the infestation is heavy the white egg sacs may be so numerous as to make the stems appear white for their entire length. The pest overwinters as fertile though immature females. Eggs are laid in June and the young, on hatching, establish themselves on the twigs.

The Peony scale, *Pseudaonidia paeoniae* Ckll., is common in the south but has been found occasionally as far north as Washington, D. C. Foliage of infested plants becomes thin and the twigs and en-

tire branches may be killed. The insect apparently deposits a toxin in the plant as it feeds, killing or stunting the tissues immediately beneath it so that the outer bark of the twigs tends to overgrow the insect, more or less concealing it, and producing a globular swelling or nodule. As a result, badly infested twigs have a bumpy appearance. Eggs are deposited underneath the insect and remain overwinter, hatching in late March to early May, and like the newly hatched crawlers of other species these scatter over the plant where they settle down and feed. There is only one generation each year.

CONTROL

The control of scale insects calls for the use of a suitable contact insecticide. Summer oil emulsion has been used effectively against these pests and is usually applied at the rate of 2 per cent, 2 gallons of the emulsified oil making 100 gallons of spray. In smaller amounts this is approximately 2 tablespoonsful to the gallon. The oil spray can be made even more effective by adding lindane to it at the rate of 1 pound of the 25 per cent wettable spray powder to each 100 gallons. In smaller amounts this would be approximately 1 teaspoonful to the gallon. Malathion has given very good results against similar insects when used at the rate of 2 pounds of the 25 per cent wettable spray powder in 100 gallons of spray. In smaller amounts this is about 1 tablespoonful to the gallon. DDT in the emulsifiable form has also been effective against many scale insects. Use this material according to the manufacturer's directions.

Control measures should be directed against the nymphs or crawlers. Sprays applied soon after the eggs begin hatching usually produce best results. Oil sprays have one advantage over most others in that they will penetrate the protective coverings of most scale insects.

AZALEA MITE

The Azalea mite, *Vasates atlantazaleae* K., is the cause of considerable damage to Azaleas in the east, especially to *Rhododendron molle* and its varieties. Infested plants take on a rosetted appearance and sometimes become yellowed or bronzed in coloration. Leaf margins will be rolled under and the leaf growth stunted as a result of the feeding of small, nearly invisible pear-shaped mites on the under surfaces of newly developing leaves.

Top. Cyclamen mite injury to Azalea. Photo by author. Lower left. Rhododendron whitefly. Eggs and larvae on underside of leaf. Photo by C. F. Doucette. Lower right. Azalea girdled by root weevil grubs near surface of soil. Photo by author.

CONTROL

Apply a spray containing malathion as soon as the first damage is noted, usually in late June. The spray should contain from ½ to ¾ pound of the actual toxicant per 100 gallons. Repeat at intervals of ten days to two weeks if necessary. Direct the spray against the undersides of the leaves.

INSECT CONTROL IN THE GREENHOUSE OR FRAME

Certain insects may become pests in the greenhouse or frame where Rhododendrons or Azaleas are forced or propagated. In most instances, these are common greenhouse pests, showing little preference for the plants they attack. They seldom appear on Rhododendrons or Azaleas when growing in the open under field conditions. A brief discussion of some of the more common of these seems to be in order.

AZALEA LEAF MINER

The Azalea leaf miner is the larva of a tiny yellowish moth, *Gracilaria azaleella* Brants. It is primarily a greenhouse pest but may be carried into the field and can readily become established outside. Feeding of the larvae makes the plants very unsightly, injuring the leaves and reducing their activities. The small moth lays her eggs on the leaves. Tiny caterpillars hatch from these and mine the tissues of the leaves, producing irregularly shaped tunnels and blotches. When about half grown they leave these mines and fold back the edges or tips of the leaves, making shelters in which to live and feed while completing their development.

The Azalea leaf miner has been difficult to control because the larvae are protected by the tunnels in which they feed and because there are several overlapping generations each year. However, some of the newer insecticides have given very good control, particularly DDT, lindane and malathion. When applying the older insecticides, particularly lead arsenate, it was desirable to have the insecticide on the leaf before the larva turned the edge or tip back, since it was difficult if not impossible to get the poison into the shelter after it had been formed. It is advisable to keep this in mind when applying the new insecticides also. The use of DDT may encourage the development of a spider mite population, while the use of malathion will help control these pests. (See under lace bugs for formulae.)

RED SPIDERS—SPIDER MITES

Spider mites are small and almost invisible to any but the sharpest eyes. The average gardener can satisfy himself as to whether or not his plants are infested by jarring the leaves over a sheet of white paper. The mites will fall off and appear as specks on the paper. If these specks move, then the gardener can be quite sure he has an infestation of spider mites. There are several generations each year, the generations overlapping so that all stages can usually be found at any one time. Development in the greenhouse is practically continuous throughout the year.

Spider mites feed by sucking the juices from the undersides of the leaves. The damage appears first as small white stippling on the upper surface of the leaves. As the injury progresses the stippling coalesces and the leaves take on a dried or burnt appearance. A heavy infestation is usually accompanied by considerable webbing.

The two-spotted mite, *Tetranychus bimaculatus Harvey*, is distributed throughout the United States. It is often a pest of Azaleas, particularly when they are grown in the greenhouse. This is the mite that is known as the yellow mite in parts of the south. It does not injure Azaleas so severely in the south as the southern red mite, but infestations of both may occur on the same plant. Infestations of the two-spotted mite are usually accompanied by a webbing on the undersides of the leaves and the mites tend to restrict their activities to the area covered by the web. Feeding within this area may be severe, the effect showing as reddish spots on the upper surface of the leaf. The mites are hairy creatures, yellowish in coloration, with dark brown areas on the sides toward the rear of the body, hence the name "two-spotted mite." The spherical eggs are yellowish and are usually laid on the undersides of the leaves.

The southern red mite, *Paratetranychus ilicis* McG., is a major pest of Azaleas growing outside in the south. Heavily infested leaves appear as if sprinkled with red pepper. The mites feed on both surfaces, causing the upper surfaces to become reddish brown. Severe infestations may discolor all of the leaves and cause some of them to drop. Adult females may be nearly black, but males and nymphs are usually light red. The body of the mite is covered with spiny hairs which curve backwards. Most of the red spherical eggs are deposited on the lower surfaces of the leaves. Infestations build up during the winter months and reach the greatest population density in the spring. Infestations may extend into the summer under favor-

able conditions, but are usually of no economic importance at this season.

CONTROL

Spider mites can be controlled by dusting or spraying with an acaracide such as sulfur, aramite, ovotran or malathion. Sulfur is an old time remedy, seldom used at present because of the danger of injuring the plants. Aramite (chlorethyl (butyl phenoxy) methyl ethyl sulfite) is an effective acaracide. Ovotran (p-chlorophenyl p-chlorobenzene sulfonate) is also effective against most spider mites and will kill the eggs as well as the active stages. Malathion is considered to be the safest of the organic phosphate insecticides but should be used with care. The last three are formulated as wettable spray powders. Use according to the manufacturer's directions. The spray should be applied to the lower surfaces of the leaves. If the infestation is well established and much webbing has been done, the grower may have difficulty in applying the spray effectively. It may be advisable to make a second application 10 days following the first to kill any mites not killed with the first application and to kill those hatching from eggs.

GREENHOUSE THRIPS

The green house thrips, *Heliothrips haemorrhoidalis* Bouché, is probably the most common of several species of thrips known to injure plants growing in greenhouses or in frames. The adult thrips are flat, black bodied insects with short legs and narrow light brown wings which lie along the back. These are about 1/20-inch in length and quite active. The newly hatched nymphs are almost microscopic in size and practically colorless. As they grow, they become yellowish in color. Thrips, like red spiders, have a number of generations each year. The eggs are deposited in the leaf tissue and hatch in from 20 to 35 days. Development in the greenhouse is practically continuous throughout the year.

These small slender insects feed by rasping and rupturing the surface cells and lapping up the plant juices and chlorophyll. This causes the upper surfaces of the leaves to take on a blotched appearance, somewhat finer than that produced by lace bugs. The under surfaces of the leaves usually assume a silver-like appearance marked by small dark spots of excrement.

CONTROL

Excellent control of thrips in the greenhouse can be obtained by applying a dust or spray containing DDT. The dust should contain 5 per cent DDT and should be applied from below so that it will billow up through the foliage, coating the lower surfaces of the leaves. If a DDT spray is used, it should be prepared to contain 1 to 2 pounds of the 50 per cent wettable spray powder in each 100 gallons of water. In smaller amounts this is 1 to 2 teaspoonsful per gallon. Lindane, chlordane and malathion have all been used with success. Obtain the wettable spray powder and apply according to the manufacturer's directions.

CYCLAMEN MITE

The Cyclamen mite, *Tarsonemus pallidus* Banks, is often a serious pest of Azaleas in greenhouses where they are being grown and forced in the florists' trade. These small, worm-like mites are practically invisible to the unaided eye. They prefer the tenderest growing parts and are able to enter the buds, both flower and vegetative. Injury consists in stunted and badly distorted growth, and discolored and distorted flowers.

CONTROL

Insecticide control of the Cyclamen mite has been difficult and practically impossible. Some of the newer insecticides have been more effective than were the older. There are a number that will kill the mites on contact. Summer oil emulsion at 2 per cent will do that and chlordane has given some promise in California. The difficulty is due to our inability to penetrate the buds with the insecticide. Unfortunately, the organic phosphate insecticides such as TEPP, parathion and malathion, that are so effective against the spider mites, gave disappointing results against the Cyclamen mite. The "systemics" belong to this last group, but they too were ineffectual.

Fumigation with methyl bromide is the most dependable way known to date to clean out an infestation. Many commercial growers use methyl bromide fumigation as a routine measure in the production of their stock. This involves the construction of a gas-tight fumigation chamber equipped with a fan for circulating the gases, heating elements and temperature control, suitable dispensing equipment, and an exhaust fan for quickly and safely removing the poisonous fumes. None of this equipment needs be costly or elaborate,

but it is all essential. The methyl bromide should be used at the rate of 2 pounds per 1000 cubic feet, and the plants exposed to the gases in the fumigating chamber for 2 hours at a temperature of 70° F.

APHIDS

Aphids, various species, often infest rhododendrons in the frame or greenhouse. They feed on the tender young leaves, causing them to curl and become badly distorted. Since many Rhododendrons hold their leaves for several years, these injured leaves remain to detract from the appearance of the plant until shed several years later.

CONTROL

The timely use of a good contact insecticide will give control. Nicotine and soap are old standbys. Unfortunately, the prevailing temperature is often too low for good results. Lindane and malathion give more dependable results. (See under lace bugs for suggested formulae, or follow the manufacturer's directions.)

REFERENCES

Most of the information contained in this article is to be found in the literature. Additional information on the life histories and control of the insect pests of Rhododendrons and Azaleas will be found in the following publications:

Latta, Randall. 1937. The Rhododendron Whitefly and Its Control. U.S. Dept. of Agric. Circ. No. 429.

English, L. L. and G. F. Turnipseed. 1940. Insect Pests of Azaleas and Camellias and their Control. Alabama Agric. Expt. Sta. Circ. 84.

Felt, E. Porter and W. Howard Rankin. 1940. Insects and Diseases of Ornamental Trees and Shrubs. The Macmillan Company, New York, pp. 435-439.

Doucette, Charles F. 1941. *Eucordylea huntella* Keifer as a Pest of Rhododendron. Jour. Econ. Ent. 34:588-589.

Knowlton, George F. and Ray L. Jones. 1941. Control of Strawberry Root Infesting Weevils. Proceedings of the Utah Academy of Sciences, Arts and Letters, 18:23-29.

Essig, E. O. 1947. Insects of Western North America. The Macmillan Company, New York, pp. 749 and 750.

Hume, H. Harold. 1949. Azaleas, Kinds and Culture. The Macmillan Company, New York, pp. 172-178.

Cory, Ernest N. and Freeman Weiss. 1952. Azalea Enemies. National Horticultural Magazine, The Azalea Handbook, :123-133.

Andison, Harry. 1953. Control of Root Weevils in British Columbia. Canadian Dept. of Agric., Science Service, Processed Publication No. 78 (Entomology).

RHODODENDRON DISEASES

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DR. MAKSIS EGLITIS*

This discussion of Rhododendron and Azalea diseases is based upon the available literature on the subject and upon four years of study in Washington state by the authors. They have been increasingly impressed with the relatively disease-free qualities of this group of plants, when the right varieties are grown in the proper location under suitable cultural conditions. Conversely, the authors have found the greatest amount of disease on plants grown in wet, poorly drained soil or on tender varieties grown in exposed locations. Proper culture is more than half the battle against diseases of Rhododendrons.

Briefly, control consists of the following three main procedures:

1. Proper culture.
2. Removal of diseased plants, branches or leaves in so far as practicable.
3. Spraying with a suitable fungicide when necessary. Fungicides are discussed in detail on the last page.

Detailed suggestions for disease control are given in the following discussion.

WILT AND ROOT ROT

Wilting, yellowing and death of the upper portions of Rhododendron and Azalea plants is usually an indication of a poor root system caused by excessively acid or alkaline soil, waterlogging, insect injury, or fungus attack. Although many different fungi have been reported causing root rots, *Phytophthora cinnamomi* seems to be the main culprit in the East Coast, West Coast and southern states. It is world-wide in distribution, attacking more than 100 other plants including deciduous and evergreen broadleaves and conifers. On Rhododendrons it is probably responsible for more damage in nurseries than all other disease organisms combined. Green leaves of affected plants first become a dull yellowish green, wilt and eventually turn brown. The roots and sometimes the lower stem are more or less decayed and brown in color.

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Rhododendron ponticum is very susceptible to the root rot fungus —but most other species and varieties can be attacked under favorable conditions. Young *R. ponticum* plants are more susceptible than are plants four years old and older. It is probable, however that the fungus also establishes itself on older plants and is carried inadvertently from nurseries into home gardens.

Investigations on Rhododendrons and many other plants have shown that wet conditions favor attack. Thus the disease most often appears under waterlogged conditions, whether such waterlogging is caused by inadequate drainage, presence of a hardpan, or by a heavy soil. The fungus has been isolated from diseased nursery stock on soils with a pH range of 3.2 to 7.0 and on roots as deep as 30 inches. Infection probably occurs at or about 70° F., but once the fungus enters the plant it can probably grow at lower temperatures.

The wide host range and distribution of this parasite coupled with its deep penetration in the soil makes it very difficult to control. Since it is a water-loving fungus, one of the most important control measures is to avoid planting Rhododendrons on heavy or poorly drained soils. Excessive irrigation should be avoided, but both Azaleas and Rhododendrons need considerable water for vigorous growth. Because *R. ponticum* is so susceptible, other rootstocks or self-rooted plants should be used in areas where the disease is severe. Diseased plants should be removed and the site planted to grass or some annual plant.

BRANCH BLIGHT

Individual branches may die as a result of root injury, or they may be killed by direct fungus attack. The two fungi most often responsible for such attack are *Phytophthora cactorum* and *Botrytis cinerea.*

When stems are invaded by *Phytophythora cactorum,* a brown sunken canker is formed and the leaves above this area wilt, become discolored and die. The fungus can also attack faded flower clusters and leaves. It produces brown blotches on the leaves and may penetrate from them into the stem, causing a general dieback. Good aeration helps to control this organism since it thrives under dense shade and high humidity. Diseased branches should be removed well below the affected area. If a large portion of the plant is diseased, the entire shrub should be discarded in order to prevent the fungus spreading to adjacent plants. Spraying with a weak copper fungicide has also been recommended, immediately after blooming. This same fungus

can attack many other hosts, one of the most susceptible being Lilac. Therefore, the latter should never be planted adjacent to Rhododendrons, especially in shaded and damp locations.

Botrytis cinerea usually attacks only succulent twigs in shaded locations. It produces a brown dieback of leaves and stems which become covered with a gray fungus fuzz under moist conditions. Providing better aeration, and decreasing the succulent growth will help to control it. The use of copper sprays at 7 to 10-day intervals during cloudy weather has been recommended. Captan has given promising results in preliminary tests at the Western Washington Experiment Station.

BUD BLASTING

Flower and leaf buds may be killed by frost or by one of several different fungi, including the fungi responsible for branch blight and especially *Botrytis cinerea.* Although *Pestalotia macrotricha* is usually considered a weak parasite, the authors have found it on buds in western Washington under conditions that indicate it to be strongly parasitic at times. In all cases of bud blasting the buds die and turn brown. For control, it is usually sufficient to remove diseased buds, improve aeration, and keep the plants growing vigorously but not lushly. If a spray appears necessary, a weak copper fungicide should be used at 7 to 14-day intervals when the buds are forming.

We probably hear more of Sporocybe (*S. azaleae* or *Briosia azaleae*, a synonym) than of any other type of bud blast. It is reported to be serious on cultivated Rhododendrons in southeastern England. However, in the United States it is most destructive on our native Rhododendrons and Azaleas including *R. macrophyllum* on the West Coast, and Azaleas *R. arborescens, R. nudiflorum* and *R. viscosum* and Rhododendrons *R. catawbiense* and *R. maximum* in the East and Southeast. It has caused trouble only occasionally on cultivated types in the United States.

Infected flower buds, and sometimes leaf buds, turn brown and die. The dead buds later become covered with short knobbed black bristles containing the spores of the fungus. Diseased buds may remain on the plant for several years. We have seen 20% of the buds killed in certain stands of *R. macrophyllum* in Washington, but reports elsewhere indicate that losses as high as 98% have been observed. The stems and leaves on *R. macrophyllum* are seldom affected, but the fungus has been known to kill branches and even entire plants of Azaleas in Massachusetts.

UPPER LEFT. Azalea leaf gall. UPPER CENTER. Sporocybe bud blast. UPPER RIGHT. Septoria leaf spot on Azalea. LOWER LEFT. Rust on upper and lower surfaces of Rhododendron leaves. LOWER RIGHT. Freezing injury occurring when the buds were expanding. Photos by authors.

The most important control measure for home gardens is the removal of diseased buds. If this is not sufficient, it should be supplemented with copper sprays (such as 6-6-100 Bordeaux) during the fall months. Recent workers in England have found a relationship between the incidence of disease and leafhoppers and therefore recommend spraying with DDT during the egg-laying period of the insects.

LEAF SPOTS

Brown or grey spots on the leaves are sometimes caused by the attack of parasitic fungi, of which several different kinds have been found on Rhododendrons. Some of the most common ones are: *Pestalotia* spp., *Cercospora* spp., *Phyllosticta* spp., and *Lophodermium* spp. The spots may vary in size, shape and color but the control for them is about the same: (1) Removal of all infected leaves in so far as practical; (2) Collection and burning of all fallen leaves; (3) Increasing aeration and sunlight if plants are in dense shade; (4) If serious, spraying with a weak (4-4-100) Bordeaux mixture, beginning immediately after blooming and continuing at 10 to 14-day intervals during the growing season.

In the majority of cases, leaf spots on Rhododendrons are the result of some unfavorable growing condition rather than from direct action by parasitic fungi. It is true that one or more fungi can usually be found in most leaf spots, but in these cases such fungi usually have attacked already injured leaves. The injury is often caused by low temperatures.

Freezing injury appears first as a watersoaking and later a browning of the leaf margins, a condition which progresses towards the middle and sometimes involves the entire leaf. The affected edges may curl downward. Flower buds, injured by freezing, turn black internally. Such injury may develop within a few days or may not appear for several weeks following exposure.

Late summer applications of fertilizers, especially nitrogenous types, often stimulate late tender growth which is injured by early frosts. Young growth started during warm periods in the winter may also be caught by freezing weather, and, of course, an unusually late frost can do damage in the spring, especially to early flowering types. Mature plants in good condition are more resistant to injury than are young or weakened plants.

Any condition that weakens a plant will make it more susceptible

to injury from cold temperature. The planting location is very important. Winter injury often occurs on plants in exposed locations, especially with a combination of very cold or frozen ground and a warm drying wind. Under such conditions the leaves lose more water than the roots can absorb and consequently the plants actually suffer from drought injury. Much of this type of injury can be prevented by avoiding exposed locations when planting or by protecting plants already in such locations with windbreaks. The use of mulches and partial shading is advisable. Transplanted plants should be faced in the same direction as they were originally, especially if they are large. Cold "pockets" (formed when heavy cold air flows downward into the bottoms of valleys and similar locations) should be avoided. In dangerous areas, only the most hardy types should be used.

Sun scald and drought injury may develop on some hybrids, especially in certain locations on plants set near a wall or rock that reflects heat. Azaleas often suffer from drought injury when grown on light soils and in exposed locations in the eastern and southeastern states. Mulching is essential in this area. Oak leaves and peat are often used for this purpose, as well as a living ground cover of other plants.

Although the types of injury just described cannot strictly be classed as diseases, they have been discussed at some length because they appear to be the predisposing causes for most of the leaf spots that we have seen on Rhododendrons. Consequently, the control of such spots appears to be primarily a matter of avoiding unfavorable growing conditions.

YELLOWED LEAVES

The yellowing of leaves may be the result of poor growing conditions, lack of iron in the soil, fungus or insect attack on the roots, or some other difficulty involving the root system. Iron deficiency results in the development of yellowed leaves with green veins. Such a deficiency may be temporarily corrected by spraying the plants with a solution of iron sulfate, 1½ ounces in 3 gallons of water. A more permanent correction may be achieved by applying iron sulfate to the soil at the rate of ⅓ to 2 ounces per square yard. However, if the soil is alkaline, or nearly so, the iron will continue to be unavailable unless the soil is acidified. This condition may appear where chicken manure containing lime has been used, or where plants are planted close to buildings, walls, etc., where plaster or cement has been left. The soil

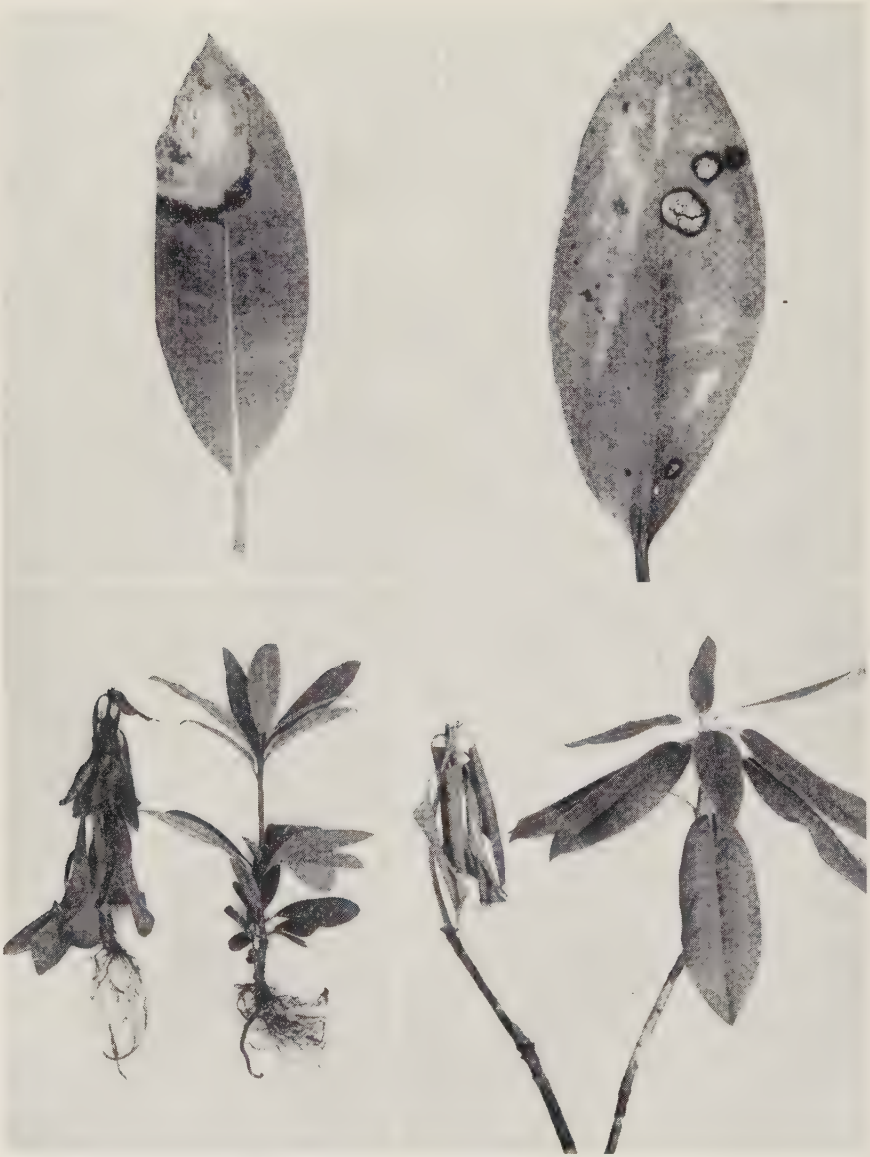
may be acidified with sulfur, aluminum sulfate, and similar compounds, but these must be used with care because an excessively acid condition is also harmful. If the possibility of a nutrient deficiency can be eliminated as the cause of yellowing, then the stem should be examined for canker formation, and the root system should be checked to determine whether the cause is waterlogging, excessively heavy soil, root decay by fungi, root weevil injury, or some other factor.

RUSTS

For several years three different species of rusts have been known to occur on Rhododendrons in the United States. They are: *Chrysomyxa roanensis* (on *R. catawbiense* and *R. minus* in North Carolina and Tennessee), *Chrysomyxa piperiana* (on *R. macrophyllum* in California, Oregon, and Washington), and *Pucciniastrum myrtilli* on several different Azaleas and Rhododendrons (particularly *R. ponticum)* in the east coast and Gulf states. Another rust *(Chrysomyxa ledi* var. *rhododendri)* is widespread in Europe and Asia, and has been found occasionally on Rhododendrons in Canada. Since this rust is most common in the alpine zone in Europe, we were surprised to discover it on cultivated Rhododendrons near sea level in Washington in 1954.

The rust diseases are first apparent as discolored areas on the upper leaf surface followed by the production of powdery masses of orange or orange-red pustules on the lower surface. The spores in these pustules are able to reinfect Rhododendrons. Another spore form may develop later which infects Spruce or Hemlock (depending on the species of rust) and the fungus can jump back again the same fall to Rhododendrons. However, the Spruce and Hemlock are not necessary for survival, since the fungi can overwinter in evergreen Azalea and Rhododendron leaves, producing a new crop of spores the following spring. Severe attacks may cause defoliation, but judging from literature reports, the rusts have seldom been injurious, except occasionally on young plants.

Control measures consist of the removal and destruction of diseased leaves wherever practicable, coupled with a spraying program if the attack is severe. Applications of sulfur dusts during July and August have been recommended. Preliminary tests by us indicate that lime-sulfur sprays (at one part of lime-sulfur in 100 to 200 parts of water) may be more effective than sulfur. Additional tests are under way



UPPER LEFT. Phyllosticta leaf spot. UPPER RIGHT. Coryneum leaf spot. LOWER LEFT. Root rot and dieback caused by *Phytophthera cinnamomi*. LOWER RIGHT. Branch blight caused by *Phytophthera cactorum*. Photos by authors.

AZALEA LEAF GALL

Leaf gall is caused by a fungus *(Exobasidium vaccinii)* that attacks both Rhododendrons and Azaleas, but is most common and serious on the latter host, both outdoors and in greenhouses. In the southeastern states, such galls on Azaleas are known as "pinkster apples" and are sometimes eaten. The disease is most troublesome in wet seasons. Azalea varieties differ in susceptibility.

Infected leaves and flowers are completely or partially converted into thickened, fleshy distorted galls which become covered with a white mealy layer consisting of spores of the fungus.

Removing the galls will ordinarily provide sufficient control but under severe conditions, it may be necessary to spray young leaves at two week intervals with a weak copper spray, such as 4-4-100 Bordeaux. Ziram has controlled the same fungus causing a similar disease of Cranberries and would probably work on Azaleas. Growers using it should watch for possible injury.

AZALEA LEAF SCORCH

A Septoria leaf spot is rather common on Azaleas over the entire United States and can cause much trouble both outdoors and in greenhouses. The spots are yellow at first, but later become brown in the center with brown, reddish or purplish margins. Small black fruiting bodies of the fungus often develop in the spots on fallen leaves. Infected leaves fall prematurely, thereby reducing growth of the plant.

As much as practicable, fallen leaves should be removed since the fungus overwinters in them. Sprays will also be necessary in areas where the disease is common. A weak copper fungicide applied at two week intervals during the summer has been the usual recommendation. Ferbam has recently been suggested and probably would be less apt to cause injury. Frost damage may predispose the plants to infection, and for that reason, growers should avoid planting in exposed locations. Plants might be covered with sheets or some other material to prevent frost injury on spring nights when late frosts are expected.

AZALEA FLOWER BLIGHT

This destructive disease (caused by *Ovulinia azalea)* occurs on Azaleas in California, and in the southeastern and Gulf states from Maryland to Texas. The first report of the disease in Europe came

from Switzerland in 1949 and it has recently been reported in Scotland. Indian, Belgian, and Mollis azaleas are most susceptible to this blight, but other types of Azaleas and even some Rhododendrons and Mountain Laurel have been attacked. It is by far the most serious disease of Azaleas in the Southeast.

Flowers are the only part of the plant attacked. The fungus produces small white spots on colored flowers and brown spots on white flowers. Under warm moist conditions these spots rapidly converge, resulting in a slimy mass. The wilted flowers remain on the plant much longer than normal. Small black disk-like bodies of the fungus (called sclerotia) develop on the diseased flowers. These overwinter on or in the soil and initiate the infection cycle the following spring. Insects may spread the fungus but their assistance is not essential.

Nabam and Zineb sprays will effectively control the organism. However, it is necessary to spray two or three times a week since all surfaces of the petals must be covered, and new blossoms are often produced over a long period of time. The spray should contain a wetting agent and should be applied as a fine light mist. Calcium cyanamid, applied to the soil at the rate of 400 lbs. per acre has inhibited production of apothecia from the sclerotia in experimental tests.

Particular care should be taken when purchasing plants to obtain them from a disease-free nursery. Also, if a supposedly disease-free nursery is in an infested area, the upper inch of topsoil (which might contain dead flowers and sclerotia) should be removed prior to shipment, in order to lessen the danger of transmitting the fungus. Obviously, plants bearing infected blooms should not be moved into an uninfested area.

Frost damage resembles Ovulinia flower blight—but flowers so damaged do not disintegrate as easily unless attacked by Botrytis. This fungus is easily distinguished by its grey fuzz which develops under moist conditions.

SEED DECAY

Seed decay is seldom a factor where viable seed is planted in a propagating mixture of fresh sand and peat or where the seed is covered by ¼ inch of shredded sphagnum moss on top of a sand-peat mixture. Unpublished data by Arthur Myhre of the Western Washington Experiment Station indicate that the latter type of seed bed should be moistened once after planting with one pint per square foot of a solution of ammonium sulfate at the rate of two teaspoonsful per

gallon. USDA experiments have also demonstrated that pure sphagnum moss (living or dead) is effective if supplemented with a nutrient solution. This consists of one teaspoonful each of superphosphate and potasium nitrate per gallon of water in an amount sufficient to saturate the moss.

Occasionally, the treatment of seed with a fungicide may be desirable, especially if the seed is old or weak. Cuprocide has been recommended for this purpose and should be used according to directions on the container. Fungicides containing thiram (such as Arasan) are safe and effective on many vegetable seeds and should be worth testing on Rhododendrons.

DAMPING-OFF OF SEEDLINGS

The sudden collapse of young seedlings, called damping-off, can be caused by several types of fungi. The disease frequently appears under conditions of crowding, poor drainage, overwatering and especially with poor ventilation. The correction of these unfavorable conditions generally assists in controlling damping-off. One of the best preventatives is the use of sphagnum moss in the seed bed. If the damping-off persists, the plants should be lightly drenched with an organic mercury solution, such as Semesan (1 ounce in 3 gallons of water) according to directions on the package, or with thiram (2 ounces of 50% strength in 3 gallons of water).

Botrytis blight also develops on seedlings and cuttings under crowded, humid conditions such as exist in a grafting case. Captan has given us the best control of this fungus in preliminary studies. Sprays should be applied at weekly intervals.

MISCELLANEOUS

Cuttings may be decayed by fungi, but this trouble is seldom experienced if strong cuttings are planted in fresh media and given the proper rooting conditions. As an additional precaution against decay and as a stimulant to rooting, cuttings may be treated with a mixture of hormone plus thiram. Such mixtures are now available commercially.

Many other diseases have been reported on Azaleas and Rhododendrons, but they seem to be serious only occasionally, or else have only a limited distribution. Among these are Armillaria rot, powdery mildew, Verticillium wilt, leaf gall on Rhododendrons, Monilina brown rot, Glomerella canker, and slime mold on seedlings. Black walnut and butternut trees have been reported as injurious to rhododendrons

and some other ornamentals. The roots apparently secrete a substance that causes the plants to wilt and sometimes die.

FUNGICIDES

Nabam, zineb, ferbam, ziram, thiram and captan are general names of fungicides sold under many different trade names. A few examples of those mentioned in this article are: captan = Captan 50W and Orthocide 50 Wettable; ferbam = Fermate and Ferradow; nabam = Dithane D-14 and Parzate Liquid; thiram = Tersan and Thiram; zineb = Dithane Z-78 and Parzate Dry; ziram = zerlate and Karbam White. They should be used where recommended, according to directions in the packages.

Freshly-made Bordeaux (4-4-100) is the spray most often recommended for Rhododendron diseases, but half-strength rates of most other copper fungicides would probably be just as effective and certainly much easier to prepare. Dusts are almost as effective as sprays. All copper fungicides should be used judiciously to avoid injury. They may cause brown spotting and leaf drop on sensitive hybrids as much as several months after spraying.

A three gallon mixture of 4-4-100 Bordeaux is prepared as follows: Dissolve 4 level tablespoons of finely-ground copper sulfate (bluestone) in 6 quarts of warm water by suspending in a cheesecloth bag near the top of the water in a nonmetal container. Dissolve 7 level tablespoons of a good spraying grade of fresh hydrated lime in 6 quarts of water and allow to soak for 30 minutes. Add the copper sulfate solution slowly to the lime solution, stirring continuously. Pour into sprayer through cheesecloth or a piece of screen to remove lumps. Use mixture immediately and rinse out sprayer afterwards. If a wetting or sticking agent is used, mix it with a small amount of water first, then add slowly to the Bordeaux mixture, stirring meanwhile.

The authors have naturally leaned upon several publications in preparing this manuscript. Among these publications are three that Rhododendron growers will find especially helpful in supplying additional details on certain diseases.

1. Anonymous. 1952. Azalea Enemies. The Azalea Handbook, The American Horticultural Society, p. 123.

2. Gill, D. L. 1953. Petal Blight of Azalea. Plant Diseases, The Yearbook of Agriculture. pp. 578-582.

3. White, Richard P., and C. C. Hamilton. 1935. Diseases and Insect Pests of Rhododendron and Azalea. New Jersey Agri. Exp. Sta., Cir. 350.

GROWING FRAGRANT RHODODENDRONS

DR. PAUL J. BOWMAN

There are many fragrant Rhododendrons included in the Anthopogon, Auriculatum, Azalea, Edgeworthi, Fortunei, Maddeni, Moupinense, and Stamineum Series. The alleged fragrance of some of these Rhododendrons is as elusive as that of the *Camellia japonica* 'Herme,' depending, of course, on the acuity of your sense of smell.

Our purpose is a discussion of the most fragrant Rhododendrons (excepting the Azalea Series). These are included in the Edgeworthi and Maddeni Series and their hybrids.

Immediately you respond that these Rhododendrons may be very fragrant but they also have always been considered tender.

Tenderness may be defined, as English Ratings indicate, as (E) requiring shelter in most favored gardens, (F) usually a greenhouse shrub, or (P) early flowering. Such a definition and rating is subject to considerable variation. Hardiness may be a better comparative term but no more revealing to you and me growing Rhododendrons in our gardens.

Hardiness or tenderness is a very complex problem in the growing of these Rhododendrons. It is affected by temperature, humidity, rainfall, proximity to the ocean, air currents, altitude, shade, sunshine, source of seed (local or native), acclimatization, and other factors yet to be determined. Any of these factors may be a cause of failure. And still we all agree that Rhododendrons are extremely adaptable to adverse conditions. We insist that these fragrant Rhododendrons are no exception.

Ideally we would think that the native habitat of these Rhododendrons should be reproduced in our gardens if we wish to grow them. Many of them are epiphytes growing in only leaf mold high up in the forks of Oak and Magnolia trees or in the tops of trees 50-60 feet high *(R. dendricola)*. Certainly they have not grown under those adverse circumstances by choice but by necessity to get up out of the jungle darkness into some light.

Sir Joseph Hooker introduced these fragrant Rhododendrons when he found them in the Sikkim-Himalayas in 1849-51, sending seed to England. His notable discoveries included *R. ciliatum, R. dalhousiae, R. edgeworthi, R. lindleyi* and *R. maddeni.*

When Hooker found *R. dalhousiae* he wrote, "the ground was strewn with lily-like flowers dropping from the epiphytal plants on the enormous Oaks overhead. I have dedicated to the Lady of the present Gov. General of India the noblest species of the whole race." Incidentally Lady Dalhousie died at sea while returning to England but she no doubt had seen this Rhododendron growing at Darjeeling.

Sir Joseph Hooker found *R. dalhousiae* flowering in April and growing as low as 6000 feet altitude. The mean temperature was 55° F; with a low in January of 41° F; and a high in July of 65° F. The atmosphere was mild and moist, eminently suited as a Rhododendron habitat.

In his monograph on the "Sikkim-Himalayan Rhododendrons", Hooker describes *R. edgeworthi* as pendulous from trees, growing at an elevation of 7000-9000 feet, "a truly superb species from the size of the flowers, their roseate tinge on a white background, and the very wrinkled surface of the leaf. In size and shape of flowers it approaches *R. dalhousiae,* next to which I would place it." How Hooker failed to mention the fragrance of this Rhododendron is hardly understandable, because, in our experience, it is the most fragrant of all his introductions. It flowered in May-June.

R. maddeni was found by Hooker, flowering June to August, at an elevation of about 6000 feet, and described as having "large white flowers, numerous stamens and ten celled fruit. The flowers are odorous".

R. lindleyi, although resembling *R. dalhousiae* in some respects, in our experience surpasses the latter in it's delicious fragrance, cold marble whiteness and size of flowers. Its growth is upright, cane-like, and it insists on this habit of growth. Side branches grow out below the old flower stalk but if you break out a terminal bud, most frequently a bud will take off just below the break and go skyward in its place. For the confusion between the identity of these two Rhododendrons, not apparently recognized in the early dried specimens, nor by Hooker, reference should be made to the Notes from the Royal Botanic Garden, Edinburgh, vol XII, No. LVI, July 1919.

R. taggianum is similar in its habit of growth, delicious fragrance and white flowers. Both have a golden yellow throat. The latter was considered the "gem of George Forrest's 1925 collection", by Hutchinson.

R. scottianum is characterized by the elongated new leaf bud

UPPER LEFT and RIGHT, and LOWER RIGHT respectively, *R. megacalyx, R. burmanicum,* and *R. taggianum,* of the Maddeni series, grown and photographed by John Bacher, Portland, Ore. LOWER LEFT, *R. bullatum,* Rock No. 135, of the Edgeworthii series, grown by Rudolph Henny, Brooks, Ore.

growth at the time of flowering. Mr. Hutchinson considered it one of the best of the ciliicalyx subseries. With us *R. ciliicalyx* itself is by far the best of its subseries.

Mr. George Forrest found *R. ciliicalyx* in June and July, 1906 in dry, rocky situations in W. Yunnan at 10,000 feet. He described it as a shrub of 3-6 feet with white fragrant flowers with exterior tinged rose and with a rich yellow blotch. It was discovered by Abbe' Delavay in Yunnan in 1883 and is the Chinese ally of *R. formosum.*

R. cubitti has frilled flowers, like *R. veitchianum,* but bristly shoots, leaf margins and petioles as *R. formosum.*

R. formosum, one of the parents of 'Fragrantissimum', is a species readily grown from seed and cuttings. The latter root readily and flower in two years.

R. megacalyx was described by Kingdon Ward, "Plant Hunter in Tibet", as growing in deep, shady gullies, on granite cliffs and rocks, never on trees, always mixed with other shrubs, often in thickets so tight it is impossible to break through them,—with beautiful, nutmeg scented, stainless marble white trumpets, of paper thin texture.

R. veitchianum has beautiful large white flowers with multifrilled edges and a light greenish throat.

R. ciliatum is noted for its hardiness, its very floriferous low growing habit and especially for its flowering at an early age. It flowered in two years from the seed sent to England by Dr. Hooker who collected it above 10,000 feet altitude.

The fragrant Rhododendrons flower at a relatively early age. Many of them seem to grow almost continuously. Our *R. taronense* is producing flowers and vegetative growth throughout the year in the lath house. *R. nuttalli*, outside, continues growth too, its capsules taking almost the full year to mature.

R. crassum and *R. maddeni* stand a lot of wind and have been used as hedges in Cornwall.

R. bullatum is evidently a Chinese form of *R. edgeworthi* but is much hardier and more compact in growth. The Kingdon-Ward pink form is considered to be the best.

Mr. E. H. Wilson describes *R. excellens* as "undoubtedly the grandest of the Chinese rhododendrons, comparable only with the Indian *R. dalhousiae*, its nearest ally".

R. nuttalli and *R. sinonuttalli* are almost idential except for a few minor botanical differences. Mr. J. Hutchinson, in the Royal Botanic Garden Notes, as above noted, described *R. nuttalli* as "perhaps the finest of the lepidote-leaved Rhododendrons". Sir Wm. Hooker described it as the "Prince of Rhododendrons". Mr. F. Kingdon Ward has referred to it as the "Madonna of Rhododendrons." He also describes *R. sinonuttalli* as having "Capsules three inches long and three inches round at the base. The seeds, which are a rich, mahogany brown, have a peculiar unctuous feeling, like soap stone."

There are *R. odoriferum*, *R. polyandrum*, *R. carneum*, *R. manipurense*, *R. parryae*, *R. valentinianum*, *R. johnstoneanum*, *R. burmanicum*, *R. rhabdotum*, *R. dendricola*, *R. supranubium*, and other

Photo Rudolph Henny

R. diaprepes blooming in Rudolph Henny's garden, Brooks, Ore.

species, all growing here. Then there are the hybrids of the fragrant Rhododendrons most frequently grown, viz: 'Countess of Sefton', 'Lady Alice Fitzwilliam', 'Fragrantissimum', 'Princess Alice', 'Countess of Haddington', 'Forsterianum', 'Cilpinense', 'Exoniense', 'Macnabianum', and the noblest of them all, 'Victorianum'. This last is a lower, more compact grower with larger flowers than either of its parents, with the same foveated corollas, "molded as by a potter's hand".

The order of these hybrids, in degree of fragrance, is 'Fragrantissimum', Princess Alice', 'Macnabianum,' 'Countess of Sefton', 'Lady Alice Fitzwilliam', and 'Forsterianum'. It is interesting to note that

Cowan, in the Rhododendron Yearbook, 1953, page 50, stated, "Another hybrid, a cross between *R. ciliatum* and *R. edgeworthii*, raised about 1860, known as 'Macnabianum,' in honor of McNab the Curator, is no longer in the Garden and is probably lost to cultivation." Nevertheless large shrubs of this fragrant hybrid are growing happily in California in the open.

Further description of these Rhododendrons may be easily found in the literature.

Millais in "Rhododendrons", vol. II, says that 'Forsterianum' is the best of all cool greenhouse hybrids. It does very well outside with us, has pure white flowers stained yellowish green inside, is scented, and has frilled edges.

Dr. Hooker had his friends plant the Himalayan Rhododendrons in Western Scotland and S. W. England and Wales. The sea kept off the frost and it was never so cold in winter nor so hot in summer.

Mr. Wm. Watson in his book on "Rhododendrons and Azaleas" stated that "the Sikkim Rhododendrons are happiest in those parts of England which are close to the sea".

Mr. J. G. Millais in his monograph on Rhododendrons stated that "the Himalayan Rhododendrons and their hybrids are such magnificent plants and bear such unique flowers that those who live in districts unsuitable to their culture outdoors should possess them in a large unheated green house. Grow them in beds of peat and sand between Camellias and other semi-temperate shrubs as at Kew."

Mr. G. G. Nearing, in the 1948 A.R.S. Yearbook, wrote that we should "not ignore the fundamental fact that hardiness is an attribute of individual plants rather than of species. Many years must elapse before the hardiest of each species can be isolated and multiplied for garden use".

Mr. F. Kingdon Ward, in his book "Plant Hunter's Paradise", wrote that "Plants raised from native seed are hardier than plants raised from seed of the same species in exile. Seeds collected from specimens near their topmost limit of growth give rise to hardier plants than those raised from seed collected at a lower altitude".

"If cultivated plants can be brought to flowering age without being seriously damaged or cut by frost, they will henceforth stand a better chance of survival."

"Tender Rhododendrons should be grown in copses, sheltered, shaded, and on sloping ground, not in bottom lands where the cold air sinks and freezes".

In the R. H. S. Journal vol. XXIX, p. 26, 1904, Sir John Llewelyn wrote about these Himalayan species and hybrids, "My experience is that if the wood is well hardened after the summer's growth they will stand any amount of winter frost at 4° F; the greatest risks being incurred by the species with early leaf action, which are cut back by May frosts".

According to the American Rhododendron Society Hardiness Ratings, these fragrant Rhododendrons are rated at H-5 (15° F.) or H-6 (25° F.).

Mr. Roy Hudson in the 1949 A.R.S. Yearbook writes that "inspection of the large plantings of the Himalayan species and hybrids in Golden Gate Park, San Francisco, on January 26, 1949, shows no damage after three weeks of the coldest weather ever experienced here, 20° F. (12° below freezing)". Normally the range of temperature in San Francisco is very small, the coldest month being December with a mean of 51° F. and the hottest month being September with a mean of 61° F.

There is also a large planting of these fragrant Rhododendrons in the University of California Botanical Garden, at Berkeley. Dr. Helen-Mar Wheeler and Mr. Harry Roberts have advised me (March 24, 1954) that "the thermometer at the Garden has not dropped below 30° F. this winter and touched only 28° F. last winter. In December 1949 there was one night at 18° F; and 20°, 22°, and 24° F. were also recorded in that cold spell (frost for 3 weeks)".

Our garden at Fort Bragg, California, is about 200 feet above sea level, and about one-half mile from the Pacific Ocean. The garden faces the West, protected from the North wind by a house and by conifers and *R. macrophyllum*. A lath house is in the South East corner of the acre which also includes our residence. Our greatest problem is the high wind which blows from the North West. As has been aptly said it causes all our trees to be shrubs and all our shrubs to be trees.

In 1953 our lowest temperature was 32° F. (February 9, 19, 26, March 5th), the highest was 82°, 80°, 79°, 77°, and 77° F.; on October 4, September 12, 14, October 3, and 5 respectively. Our lowest temperature here in the last 30 or more years has been about 20° F. There is a cool ocean breeze on clear days. We have considerable fog, rain, and high humidity.

Our average rainfall per year for the past 41 years has been 36.10 inches. Our greatest rainfall was 61 inches for 1940, the least was 22 inches for 1917.

At Eureka, California, yearly records over the last fifty-three years show the greatest rainfall to have been 64.47 inches; the least, 21.17 inches; and the mean, 39.53 inches. The maximum average yearly temperature was 57.3° F; the minimum, 46.4° F; and the average mean, 51.9° F. In the last fifty years the lowest temperature was 20° F; the highest 85° F; and the usual yearly range is about 35° to 75°.

These records indicate that we, as well as most of the coast line from Santa Cruz to Eureka, California, have the climate, the environment of *R. macrophyllum*, *R. occidentale*, and *Sequoia sempervirens*, and the acid leaf mold soil which these fragrant Rhododendrons love.

These Rhododendrons are grown from seed, cuttings, layers and grafts very easily. In fact, the cuttings and layers strike more readily than those of most species. Descriptions of the various methods of propagation are frequent in the literature. We grow the small plants on in the lath house in almost pure leaf mold, transplanting them outside at or about blooming age (two to six years from seed, sooner from grafts or cuttings).

Our two problems are wind and late spring frosts which may damage the flowers. We combat the former by windbreaks. To meet the latter we (a) buy some native seed from India instead of seed from English green house grown plants; (b) we grow the young plants in the lath house thus cutting down the light one-half and trying to delay the blooming cycle; (c) we place burlap over such Rhododendrons as *R. nuttalli* in the garden during the late winter for the same reason; (d) we plant for protection from the direct winter sun for the same reason; and (e) we lift and transplant in the early spring to check and delay the new growth and flowers.

In as much as we lose none of these Rhododendrons grown outside, our hardiness experience is not of much value in areas where the temperature drops below 20° F. We just don't experience that kind of weather nor any snow.

Finally, for those of you who can not meet the conditions for growing these fragrant, large, most striking of Rhododendrons, in the open, they will present you with an even greater loveliness if you will grow them in a cool greenhouse, maintaining the temperature between 40° F. and 60° F. maximum the year round. The cold house gives protection against varying temperatures and cold winds and will bring plants on earlier than is normal.

RHODODENDRONS IN THE SUBURBS OF NEW YORK

HAROLD EPSTEIN

These notes, hardly of interest to Rhododendron enthusiasts in the more equable climate of the Pacific northwest, are primarily intended for the hobbyist in severer climatic areas comparable to that of the vicinity of New York, where during the winter the temperature often drops below zero with little dependable snow covering. The other extreme prevails in the summer when temperatures are often in the 90's and at times exceed 100°. On the eastern coast, under this and other handicaps, an ever increasing group of enthusiasts appears to be broadening its interest in the newer English hybrids and advancing beyond the older "Ironclad group". There is still much experimenting to be done, more trial and testing over a period of years before there is sufficient knowledge as to the hybrids (and the species of course) adaptable to this more rigid climate.

It is interesting to note that plants do not have the adaptability of animal life. Animals from one region or climate can adjust themselves to more extreme temperatures by regulating their protective coats of fur either by thinning or increasing them. This desirable trait is missing from plant life and thus actual tests over many years is usually the only certain means of determining local adaptability when there is any doubt. In the east this adaptability usually refers to contending with the extremes of winter climate although the heat of summer can and does play havoc with Rhododendrons where there is exposure to full sun without a balance of moisture at the roots. Summer damage is often the result of the heavy spraying of Rhododendrons with the hose during the day when the intense sun is directly on the foliage. As soon as the spray is stopped each drop of water collected on the foliage reacts like a magnifying glass and produces burn spots on the leaves. This can be overcome by permitting the spray to continue until sundown or to the time when the sun is no longer on the foliage. These summer conditions are generally easier to control than the severity of the winter and the latter is by far the greater bugaboo for the eastern Rhododendron enthusiast.

Up to this point there has been no use of the word "hardiness,"

Photo Rudolph Henny
A truss of *R. orbiculare*, grown by Rudolph Henny, Brooks, Ore.

a rather vague term, but one which is all inclusive in referring to climatic tolerance during all the seasons. Hardiness usually refers to winter tolerance but should encompass both autumn and spring periods for so much undetectable damage at those times is often assumed to be caused by winter severity. It may be surprising to the novice to learn that minimum temperature is only one of several factors that enters into the problem of hardiness. The following are the major factors involved in hardiness consideration and in addition there must be many other minor conditions which could have indirect effects.

A. Climate (Minimum temperature)
   1. length of exposure
   2. speed of temperature decrease
   3. date of minimum temperature

B. Physical Exposure
   1. exposure to and protection from sun and wind
   2. air drainage
   3. snow or mulching
   4. moisture and drought

C. Plant and Growth Conditions
   1. hardening off before winter
   2. insects and disease
   3. physical condition—graft, injury, age, etc.

The entire subject of plant hardiness is a lengthy one which does not warrant further elaboration here. For those intent on more details and development of the subject refer to "Rhododendrons and Azaleas" by Clement G. Bowers (Macmillan Company, 1936). The entire subject is adequately discussed in Chapter IX. Unfortunately this book, so valuable particularly to the eastern grower, is now out of print and if not part of your library may not be too easy to procure.

While delving into the subject of hardiness, it is interesting to note that although the United States has been divided into ten climatic zones as a convenient means of determining plant hardiness, it can only be a very rough approximation and should not be given conclusive weight. The hardiness rating of Rhododendrons as determined in Great Britain is even less dependable and must often be taken with an open mind, particularly by gardeners in these eastern states. One of the best examples of conflict in hardiness rating is that assigned to *R. schlippenbachii* by the British Rhododendron Group. In the 1947 Rhododendron Handbook this was classified as a "C" species and then in the last edition, the 1952 Rhododendron Handbook, this was revised to "B." From our viewpoint this must be rated as "A" for it has survived temperatures down to 20° below zero. We certainly could not want for hardier material. It is evident from this and many other similar ratings that the more equable British climate is much different from our eastern climate although very similar to the Pacific northwest, which can do justice to so many of the British hybrids.

More recent American work on a new rating formula for Rhodo-

dendron species and varieties was started by J. Harold Clarke for the American Rhododendron Society a few years ago. This first report was covered in two past issues to which you are referred: A.R.S. Bul. 4:4, October 1950—"Ratings for Rhododendron Varieties," and A.R.S. Bul. 5:1, January 1951—"Ratings for Rhododendron Species." Unfortunately most of the hardiness ratings included therein emanated from the west where there are so many keen growers. But it is now recognized that zero temperature in Oregon climate is not equivalent to the same temperature in New York. The result is that more dependable ratings for the east must emanate from the east and that greater cooperation and reporting is necessary here.

Much experimental hardiness and hybridizing work has been done here by a limited few over a period of years and the names of Gable, Nearing and Dexter have often appeared in the past periodicals of the American Rhododendron Society. Even in this area results are often inconclusive as the New York area itself has many micro-zones and only tests can definitely determine plant possibilities. It is interesting to compare a few spots in this area—first, Guy Nearing's center of operations in northern New Jersey is a rather severe spot with 15° or 20° below zero being common. Testing Rhododendrons there, particularly new hybrids, is certainly a severe test and unquestionably a worthwhile project so that any plant emanating from there could be added to the old Ironclads and perhaps be labeled Modern Ironclad. But there is a great area along this coast where more moderate conditions exist. A startling contrast is the garden of Donald Hardgrove on the south shore of Long Island where there is a favorable maritime influence. I believe that that area has about a 20 degree average over northern New Jersey (Nearing land) so that there is great contrast between the type of plants grown.

Intermediate between these extremes is my garden in Westchester, which is two miles from Long Island Sound in a protected oak woodland with a couple of hundred feet elevation. Temperatures here are just about half way between the two previous locales with a much greater capacity for questionably hardy plants than is generally expected. In experiments with new and uncommon plants, including species and hybrid Rhododendrons, many pleasant surprises have been experienced. In fact although not tabulated, I would guess that more questionable plants have proved hardy than tender in this garden. Emphasis must be placed upon the need for studying a locale and particularly one's immediate garden. The past several

Photo Rudolph Henny

'Rosy Morn' G., a xxx variety, is a seedling of *R. souliei* X 'Loderi' G. This beautiful truss was grown by Rudolph Henny, Brooks, Ore.

years have clearly indicated that there are definite micro-zones of climate within the confines of an acre of garden. Experiment has indicated the most favorable spots in this garden, the areas where all elements involving hardiness seem to be most equable.

Let me describe the physical conditions for there must be similar conditions in other gardens in the area. The most favorable spot here is on a rocky knoll facing northwest. The background here is some neighboring pines, a stone wall and then my background plant-

ing of *Tsuga caroliniana*, some old Ironclad Rhododendrons and that very dependable *Rhododendron carolinianum* under a beautiful double flowered *Cornus florida*. With all this protecting background there is a foreground group of several Rhododendron 'Bowbells.' They have been in the garden for eight years and in this more favorable spot for half this time where they seem to be thoroughly satisfied. When originally obtained these plants were small, and realizing the questionability of their hardiness were protected for the first few winters with a covering of conifer branches. This is the procedure followed for all young plants of questionable hardiness inasmuch as many of them may be tender in their early years but later harden and react more favorably. This planting is open to the sky but receives no morning sunshine, which can be quite destructive during the winter and early spring. Planted in the same vicinity with the same exposure are the following Rhododendrons—'Pink Pearl', 'Purple Splendor', 'Goldsworth Yellow' and *R. Fortunei*. In their foreground 'Blue Diamond', *R. Williamsianum* and 'Radmosum' with an assortment of other small ericaceous material including underplantings of Azaleas 'Gumpo' and 'Hakatashira'.

Nearby are plants of R. 'Moonstone', 'Dormouse', 'Humming Bird', 'Arthur J. Ivens' and 'Temple Belle', all hybrids of *R. Williamsianum*. Most of these have been planted out for only three or four years and I must therefore be conservative about any conclusions as to hardiness. These past three winters have been comparatively mild, the low temperatures not going beyond zero, which is really not conclusive of true hardiness in this region.

The encouragement for the planting of these *R. Williamsianum* hybrids stems from the original purchase more than a dozen years ago of a neat well-budded 8 to 10-inch plant of the species *R. Williamsianum*, a few years coddling in a protected area facing northwest, and then the plant was left on its own. For the next few years it lived up to its earned reputation of being a shy bloomer and then there were but a few buds in the succeeding years. Two years ago the plant was moved to a much more exposed site where now for the second season it has set a mass of flower buds. The immediate question concerns the possibility of these buds surviving this winter. Last year's buds appeared to progress satisfactorily through the winter, but then a very mild spell in February or March followed by a very severe drop in temperature played havoc with most of the upper buds. But this plant, now 48 by 40 by 14 inches

Photo Rudolph Henny

A plant of *R. oreotrephes* in full bloom in the garden of Rudolph Henny, Brooks, Ore.

high, is always an attractive foliage plant and certainly deserves the ground space it covers.

Near this plant is a large group of the pink form of Azalea 'Gumpo', as handsome a plant as anyone could want. The few original plants obtained several years ago were set out with much uncertainty, but many propagations from these have all in turn proved satisfactory, again one of the more pleasant surprises. The combination of foliage and plant habit with the huge deep pink flowers places this Azalea in a class by itself. Both the white and pink form are well represented by groups planted as ground covers and overplantings on slopes.

Opposite the first described planting and across a level grass area is another group of Rhododendrons with several tall *Pieris japonica* as a background. In this group are a few 'Goldsworth Yellow', not too happy here for it is a very dry spot at the base of a huge

Black Oak facing south. This Rhododendron appears to do far better in a more shaded area; the foliage and habit of the plant is improved and the flowers last much longer. Others in the same group are 'Duke of York,' 'Cynthia,' 'Mrs. Charles Pearson,' Lady Clementine Mitford', and 'Jean Marie Montagu' but these seem to tolerate these adverse conditions much better than their neighbor 'Goldworth Yellow'. This group has as a foreground planting some more of the dwarf Azaleas like 'Flame Creeper', (which I believe is the same as 'Kokin-shita') somewhat like a single flowered Azalea 'Balsaminaeflora'. Incidentally these dwarf Azaleas, most of them varieties of the indica and obtusum groups are valuable plants for use as edging, borders, slope ground covers and underplanting for deciduous trees. They are extremely useful in the small garden and really warrant greater popularity than has been accorded them.

Other Rhododendrons that are farther in the background in the part of the garden that is more shaded and protected had been placed there because of the uncertainty of their hardiness. One of these is 'Mrs. Furnival', which has done exceptionally well and seems quite dependable. Next to it is 'Goldsworth Pink' which has been disappointing. Like many other Rhododendrons that are plant hardy, its buds have either partially or fully blasted during the past few mild winters so that another more advantageous spot must be found for it before a conclusive and final opinion is formed. A more successful plant is 'Christmas Cheer', the earliest hybrid in the garden. Although quite shaded and protected it has retained its dense shape and has been a dependable bloomer for several years. The elements have not affected its early bloom and it is always looked to as the introduction to the Rhododendron season. Next to it are a few 'Blue Peter', apparently hardy, but with one major fault. Its foliage is paper thin and it seems to be a delicacy for some insects for there is no Rhododendron here that has had its foliage so disfigured. I am certain that some of the many sprays could overcome this, but there are just too many duties at that early season and some tasks must be left in the background.

This part of the garden is well protected by overhanging Oaks and background Hemlocks so that while questionable Rhododendrons seem to prosper, the lack of sunshine and overhead light has proved a handicap to bud formation. While opening the area to more light can easily be accomplished by judicious tree pruning, it would also pose some new problems of exposure to the southern sun with a more drastic drought condition. Most of this garden, particularly

Photo Rudolph Henny

First bloom on a small plant of *R. dichroanthum*, grown by Rudolph Henny.

beneath the large trees is very dry. Drainage is actually too good so that with raised and sloped areas and light soil, retention of moisture in summer becomes a major problem. There are other parts of the garden that present similar problems and these are the spots that present the greatest discouragement in the growth of Rhododendrons. This has been a particularly challenging garden, irregular in all respects with massive hard stone and shallow soil areas. Much of the topography has been improved to obtain more soil and planting area and the garden is now reaching the point of

saturation. As a result, it has been necessary to be highly selective of any new material being added and space is now usually allotted to smaller and slower growing species or hybrids. Of particular interest now are the *R. repens* hybrids which seem to have some hope for tolerance of this climate. The first of these attempted here was a plant of R. 'Treasure' which prospered and bloomed for two years and which then seemed to succumb to the extremes of summer, perhaps drought. A small replacement plant is now being encouraged in a frame before planting into the open. 'Carmen' appears to be making progress but 'Little Joe' has already indicated the first signs of foliage damage by our 10° spell earlier this winter. Other hybrids of *R. repens* will be attempted here for this is the ideal type of plant for the smaller garden and keener plantsman.

An insatiable curiosity about plants of all types has resulted in a garden with a vast assortment of interesting material. As the years progress, there has been a gradual shift to woody plants with particular emphasis on Azaleas and Rhododendrons, both species and hybrids. A major part of the pleasure has been derived from the experiments with plants of borderline hardiness, and as previously mentioned, many of these experiments have been pleasant surprises. In order to obtain any conclusive opinions, much more experimenting and testing over a period of years must be accomplished in the East. It is a project that warrants much encouragement.

NOTES ON A FEW OF THE RHODODENDRONS COLLECTED BY DR. ROCK (1948)

ROBERT BOVEE

Quite a number of plants have bloomed grown from the seed collected by Dr. J. F. Rock in 1948 on the Yunnan-Tibet border. Tentative identifications from botanical specimens, leaves only, were made by the staff members of the Royal Botanic Gardens, Edinburgh, and published in the A.R.S. Bulletin for January, 1950. Because of the lack of flowers many of the numbers could be identified only as to series and not as to species.

Some of these Rhododendrons, particularly the large-leafed types, have proved to be wonderful foliage plants. Some very good species forms have bloomed. One of the big disappointments was that Rock numbers 53 and 54, identified as probably new species, have turned out to be *R. didymum* or *R. didymoides.*

There were more than thirty collections in the Sanguineum series of which many have bloomed as *R. didymum* and *R. didymoides.* Rock No. 177 is *R. sperabile* var. *weihsiense*, an open growing plant with waxy red flowers. Several plants of the Sanguineum series have bloomed with orange-red flowers, some yellow, and others yellow flowers with red lobes. One plant of Rock No. 18 has bloomed a copper red with a great deal of bright yellow inter-mixed, not unlike some forms of *R. apodectum.* These have not been identified and could be new species. One of the outstanding foliage plants of this group is Rock No. 6. No reports of this plant having bloomed have been received. A few plants came from this batch of seed with leaves appearing to be waxed and polished instead of the dull dark green leaves typical of this series.

In the Heliolepis series Rock numbers 187, 190, 186, 71, 189 and 184 have been reported as having bloomed. All are probably *R. desquamatum* with the exception of Rock No. 184 which has considerably larger flowers and leaves than the type. This has not been identified. All of these have good growing habits and are quite attractive with flowers in shades of mauve, spotted red.

Rock No. 183 is *R. oleifolium* with an upright habit of growth and very lovely pink and white flowers. Rock No. 135 is *R. bullatum* and seems to be identical with others of this species we have observed.

Photo Benj. Allen

Beautiful foliage pattern displayed by a plant of Rock No. 6, a member of the Sanguineum series. Grown by Robert Bovee, Oswego, Ore.

Photo Rudolph Henny

R. chartophyllum in full bloom in Rudolph Henny's garden. This species is very similar to *R. yunnanense.*

One of the best yellow colors we have seen in a Rhododendron is Rock No. 15, *R. xanthostephanum.* It is a low-growing compact plant in the Boothii series with small bell-shaped flowers. Another attractive dwarf plant is *R. brachyanthum* var. *hypolepidotum,* Rock No. 12. It has a tight habit of growth and attractive foliage. The flowers at first are chartreuse green soon changing to light yellow with green spots on the upper petal and orange tipped stamens. Rock No. 93 is similar.

Rock No. 30, Fortunei series, bloomed in one garden last spring with a very small flower in a good shade of pink. Rock numbers 7 and 43 have bloomed several times and are *R. cryseum.* Both have small flowers of a good yellow color. Seed of Rock No. 5, in the Saluenense series, has produced two types of plants which have been identified as *R. keleticum* and *R. nitens.* Rock No. 58 has bloomed and is *R. keleticum.* Rock No. 56 is *R. calostrotum* and has nice rosy

Photo Rudolph Henny

A plant from the 1948 Dr. Rock Expedition, Rock No. 43, Lapponicum series, grown by Rudolph Henny, Brooks, Ore.

mauve flowers. Rock No. 2 is *R. crinigerum* and closely follows the type.

Rock numbers 96 and 165 have bloomed several times and are *R. oreotrephes.* While they are fine foliage plants the flowers have been a rather dirty magenta in color, not nearly as pleasing as earlier collections. Rock 127, Lapponicum series, is probably *R. chryseum.* However, one plant from this seed had deep, dark, clear purple flowers. It is very fine but has not been identified. Rock 178 has been reported as having flowered in 1953 with dark lavender blue flowers. This has not been identified.

Rock No. 188, in the Lapponicum series, has produced three types of plants none of which have been positively identified. One form is very dwarf with blooms which closely resemble *R. impeditum.* They vary considerably in size and color. A second form has larger and somewhat less blue leaves and grows more vigorously. It has

lavender blue flowers. The third form has very tiny leaves. It is very dwarf. The flowers are as large as, and similar to, *R. impeditum.*

Possibly the outstanding plant in the Dr. Rock collection is No. 182, the true *R. sinogrande.* Several five year old plants of this are now about four ft. in height with leaves from 20 ins. to 25 ins. in length. Rock numbers 16, 25, 51. 97, 102, 167. 170 and 193 were tentatively put in the Falconeri series but it is reported that there are no true *R. falconeri* among these.

One report has been received of the blooming of Rock No. 191; no herbarium specimen was sent back with this number. This has a loose truss of 13 flowers; the corolla is creamy white with numerous red spots on all five lobes. Rock No. 192, *R. pennivenium* aff., is described as having a lax truss of 13 flowers, lobes pale pink with faint red spots and white in the tube.

We understand that further identifications have been made at the Royal Botanic Garden, Edinburgh, from their own plants growing from seed planted in 1949, but we were unable to secure the information in time for this book.

SOME COMMENTS ON RHODODENDRON BREEDERS ABROAD AND AT HOME

DAVID G. LEACH

Hybridists the world over are at work trying to produce improved Rhododendrons but these plants which are so incredibly ancient in their origin yield slowly to the manipulations of men and the sporadic progress both here and abroad seems all too slight to the impatient enthusiast who is looking for something new and better. As a practising breeder I find some comfort in the thought that it took nature approximately 50,000,000 years to bring Rhododendrons to their present eminence as ornamental shrubs, so the hybridist has not done too badly who brings about some further improvement in the 30 or 40 years of adult effort of a life's span.

There are not many Rhododendron breeders in the world today but they constitute a dedicated fraternity bound by common aims, mutual aid and irrepressible optimism. Their numbers are restricted for a number of reasons: almost any other gainful effort is certain to yield much greater financial reward. Even professional growers who breed Rhododendrons usually subsidize that activity from the earnings of routine nursery operations. Any commercially successful new Rhododendron which they produce is likely to benefit them more in prestige and publicity than in profit when all the costs are counted. Optimism and confidence in the future there must be: it takes about 6 or 7 years under good average conditions to determine the results of a cross. Some take a good deal longer. All of the seedlings must bloom, and preferably more than once, before they can be properly judged and the best selected.

Few of the breeder's aims can be achieved in one generation of plants so an additional 6 years or more are required for the second phase of development to yield the specimen which approximates the goal. There follows then a period of testing for hardiness, for floriferousness and for other characteristics which can scarcely be condensed into less than 5 years and most hybridists take much longer. Under very favorable conditions then, a minimum of 17 years have elapsed since the first cross was made and there yet remains ahead the slow, slow process of propagating enough stock to introduce commercially the breeder's prize production. If propagation starts

Photo Cecil Smith

Tall form of *R. keiskei*, grown by Cecil Smith, Aurora, Ore.

in the second year of blossoming, at the end of three years the nurseryman will have possibly 30 plants, by which time the first year's propagation can be used to furnish scions for further increase. At the end of 8 years, with careful, conservative management of the stock plants, there will be between 500 and 600 plants in existence. Thereafter the numbers increase rapidly but it will require about 10 years for a nurseryman to propagate a new Rhododendron to the best advantage for commercial introduction. Thus as much as 28 to 30 years elapses before the breeder sees the product of his original project ready for general distribution by the professional growers. Fifty years more are needed for the best of introductions to become the standard Rhododendrons of commerce. So a total of three-quarters of a century or more may

pass from the time a cross is first made by a breeder until his ultimate goal is reached and the plant becomes a staple and familiar clone throughout the nursery industry.

Few people realize that the most popular and important Rhododendrons in commerce today are 'Pink Pearl' and the other hardy hybrids which were introduced around the turn of the century. They are yielding very slowly to the sorts which were released for sale shortly after the end of the first world war, such as 'Britannia', 'Betty Wormald', 'Souvenir de Dr. S. Endtz', 'Mrs. Lindsay Smith' and others of that period. They are just coming into their peak of popularity 35 years after their commercial introduction. In the eastern United States, where these European productions are too tender for outdoor gardens, the staple Rhododendrons of the nursery industry are the Waterer hybrids introduced in the 1860's. And they are in no imminent danger of early replacement by more modern creations.

Considering the lack of profit and the far distant goal, why then do men breed Rhododendrons and with such intense concentration and fanatical devotion to their work? The answer is simple. It is one of the most richly rewarding of all creative efforts. To mold the plastic materials of plant life into a form which may give pleasure to generations of gardeners gives the same warm suffusion of satisfaction that the sculptor feels when he brings into glowing reality the magic fire of his imagination. A comforting sense of accomplishment comes from the constantly unfolding drama of plant life signalling its progress toward the breeder's dream; then the anticipation, and the fulfillment which comes with attainment are enduring rewards of the deepest and most gratifying character. Even the disappointments seem but a challenge to more determined effort. The arts command the loyalty of many men but they do not surpass the gossamer grip of beauty which inspires the breeder to create fine and lovely plants for the pleasure and betterment of his fellow man.

In the course of a world-wide correspondence with other hybridists I have concluded that the motives are the same everywhere but the methods and goals vary a great deal. Every breeder has his private conception of the ideal Rhododendron, which is conditioned by his experience and education, by the climate in which he lives, by his status as an amateur or a professional and by the local public preference in Rhododendrons. Although all breeders want the satisfaction of wide public acceptance for their hybrids, there is a great deal of

difference in attitude between the amateur and the professional breeder. For example, the amateur is quite willing to spend much time extending the blooming season and developing fine late-flowering Rhododendrons for his own satisfaction, whereas the commercial nurseryman will not breed plants which bloom after the spring gardening season is over, because there is so little public demand for Rhododendrons in July.

The cleavage between amateur and professional hybridists seems to an outsider to be especially marked in England. Many people in America have the idea that the steady procession of hybrids which has issued from the great English estates in the last twenty-five years represent enviable acquisitions to the gardens of Great Britain. This is not the case. Their awards have attracted much attention but these hybrids do not possess the hardiness and adaptability to be suitable for general cultivation there. They grace the magnificent private gardens where they originated in favored climates but it is an ironic fact that they will probably achieve much wider distribution in the benign mildness of our Pacific coast than ever they will in England. There the professional growers admire these lovely but fastidious Rhododendrons and they firmly shun them. Only a very few have proved hardy enough to gain recognition in the English nursery industry, which gets its novelties from Holland or from within its own ranks.

It had been hoped that hybridization with *R. yakusimanum* might be the means of bridging the gulf which separates the fine, tender productions of the amateur breeders from the tough, hardy shrubs needed by the English commercial growers. This spectacular species has received a great deal of attention for its triple virtues of good flowers, hardiness and superlative plant habit. Crossed with the fragile hybrids from the amateurs' favored gardens it has thus far been a great disappointment as a parent. American hybridists who have hopefully used it in their own work can only trust that they will have better luck.

At the present time it is possible to foresee a future merging of goals by Rhododendron breeders in England. The professional hybridists are trying to impart added hardiness to the amateurs' lovely hybrids by crossing them with the rugged garden Rhododendrons which are their staple in trade. The amateurs, possibly because of the enormous tax burden in England, have become much more conscious of the commercial value of Rhododendrons and many of their

breeding projects now are formulated with hardiness as a major consideration.

RR. fortunei and *discolor* are favored parents to impart cold resistance to the amateurs' seedlings and some notable hybrids derived in part from these fine species are expected to find prominent places in the professionals' lists. *R. ((wardii x (discolor x campylocarpum* var. *elatum))* 'Hawk' 'Crest'; *R. (wardii* x *Fortunei)* 'Prelude': and the older R. ('Aurora' x *fortunei)* 'Naomi' are examples from the celebrated Exbury Estate which many of the English commercial growers regard as hardy enough to suit their requirements.

Though the amateurs intend to place much greater emphasis on hardiness a foreign observer gets the impression that there is still a basic difference between them and the nursery trade with respect to their ideals of quality. The English enthusiasts who turned to hybridizing have generally been men with extraordinary knowledge of their specialty who became connoisseurs of Rhododendrons. Their judgments issued from a background of exceptional experience which applied quite different aesthetic standards than the general public uses in selecting Rhododendrons. The discernment which these amateurs cultivated resulted in an emphasis on the finer, more subtle values of the plants which they hybridized, and as a consequence their specialized attitude was not in sympathy with the public demand for the big, bold truss on a portly evergreen shrub. The 'Pink Pearl' type of Rhododendron in bloom often seemed to be regarded as a gross and blatant display of over-ripe pinkness.

The professional nurserymen, on the other hand, have been obliged to supply Rhododendrons which meet the demands of the average gardener, not alone in the milder parts of England but also in the regions of harsher climate. Their goals in hybridizing have naturally reflected the qualifications required for the greatest commercial success: hardiness; precocious flowering; easy propagation; compact habit; large, erect trusses; and popular colors. The hybridists in the nursery trade have appeared to regard the amateurs' productions as esoteric, impractical creations mainly suitable for ethereal gardens in a paradisaical climate.

There are fewer amateur hybridists in England today than before the war and the last several years have taken a cruel toll of the most distinguished figures in this field. At the present only Exbury, Bodnant, Windsor Great Park and Wisley are breeding Rhododendrons on a large scale.

The professional growers who breed Rhododendrons are crossing

Photo Rudolph Henny

One of the finest of the Triflorums, *R. augustinii*, in Rudolph Henny's garden, Brooks, Ore.

the best of the amateurs' productions with Anthony Waterer's old hybrids and the results are promising. The Waterer hybrids were intricately bred from a few species: *RR. arboreum*, *caucasicum*, *catawbiense*, *campanulatum*, *ponticum* and *smirnowi*. Some of them are known to give certain specific, desirable results when they are used as parents and they are proving extremely useful in adapting the amateurs' creations to the forthright requirements of the nursery industry.

Along other lines, the progeny of *RR. repens* and *williamsianum* are showing some dwarf hybrid Rhododendrons with large flowers for the English commercial nurserymen but many of the best are not sufficiently hardy and one wonders whether the most cold resistant forms of these species have been available to them for breeding. The trade there is emphasizing medium size, compact growing sorts and a particularly concentrated effort is being made to produce yellow and orange flowered Rhododendrons. *RR. wardii* and *dichroanthum* have been especially exploited in the newest crosses but the

formulae for breeding are inevitably becoming more and more complex and *RR. campylocarpum, wightii, caucasicum* and *fortunei* are brought in through the older hybrids. *R. lacteum* seedlings have been so lacking in vigor that this species is generally shunned despite its opulent yellow blossoms.

The Knaphill and the Exbury Azaleas still stand unequalled in England and they continue to advance in quality each year at an amazing rate as the newest seedlings come into bloom.

We have not yet seen the results of post-war hybridizing in England. The largest of the commercial hybridists are also the most cautious and they like to have 15 to 20 years of observation of a new Rhododendron growing under all sorts of conditions before they are willing to evaluate it.

Across the channel, in Holland, Rhododendron breeding centers almost entirely in the nursery industry and the Dutch hybrids reflect the demands of the export trade with other countries. There too the large, erect truss; the persistent, broad evergreen foliage; and hardiness are the principal considerations.

Breeders in The Netherlands have long specialized in red flowered Rhododendrons and they have strong, definite ideas as to the parents which yield the best color in their seedlings. *R. thomsonii* is the species most favored to give red flowered progeny. Its offspring have been good and it is their experience too that seedlings of *R. thomsonii* crossed with *R. griffithianum* and its hybrids do not exhibit the legacy of pastel colors usually imposed by the latter. It is therefore thought to be especially potent in passing on its brilliant color, even from its hybrids. For example, 'Ascot Brilliant,' a first generation descendent from *R. thomsonii* is highly regarded as a parent.

The Van Nes seedlings such as 'Earl of Athlone' and particularly 'Jean Marie Montague' (formerly called 'Hon. Jean Marie de Montague') have proved to be good sources of red flowered progeny when crossed with hardier Rhododendrons. In this connection, the hybridist must be wary of the published record of the parentage of the Van Nes hybrids. The parents were stated in reverse of the usual order. Thus 'Earl of Athlone' is given as a seedling of 'Stanley Davis' x 'No. 1 D.' The "D" stands for the original German Rhododendrons from the Royal Porcelain Factory in Berlin which were mostly F_1 hybrids with *R. griffithianum* as one parent. 'No. 1 D.' was later named 'Queen Wilhelmina.' Thus reversing the parentage to the usual order so that the seed parent is stated first, the correct parent-

age of 'Earl of Athlone' is 'Queen Wilhelmina' x 'Stanley Davis.' The parentage of 'Jean Marie Montague' is not known.

A third source of good color is thought by the Dutch breeders to come from red flowered Rhododendrons which do not lose their intensity of color when they are forced into bloom in the greenhouse. 'Souvenir de D. A. Koster,' a 'Doncaster' hybrid, is a good example of this interesting theory which presumably must have been borne out in practise.

The early generation hybrids from *R. griersonianum* are not admired in The Netherlands because of their tendency toward lax trusses and poor foliage. The advanced generation hybrids, however, are thought to be good sources of the red flowered Rhododendrons which the Dutch have been so successful in producing. 'Earl of Donoughmore' is believed to be especially promising as a parent because of its good habit and foliage in combination with firm trusses of pure color.

The Dutch breeders think that the hardy plant should always be used as the seed parent in a cross between hardy and tender Rhododendrons. Currently a great many crosses are being made between the older ironclad Catawba hybrids and the later hybrids of better color, higher quality and greater tenderness. The results are very promising and they seem to indicate that the right Catawba hybrids produce seedlings which are as hardy as are the progeny of the same crosses made with the selected color forms of *R. catawbiense* itself. 'America' and its sibling, 'Nova Zembla,' crossed with 'Earl of Athlone' and 'Jean Marie Montague' have produced hybrids which are very much admired at Boskoop.

Breeders in The Netherlands have all but abandoned *RR. smirnowi, brachycarpum,* and *maximum* as sources of hardiness in breeding. They point to the indifferent results obtained by German breeders from the exhaustive use of *R. smirnowi* over many decades of intensive effort, and their own experience with it and with *RR. brachycarpum* and *maximum* has not been productive.

The productions of German Rhododendron breeders have been distributed almost exclusively in their own country and in Sweden. The late Mr. T. J. R. Seidel produced a long list of hardy hybrids between 1880 and 1930, most of them bearing a resemblance to the old Catawba hybrids 'Caractacus' and 'Everestianum.' 'Goethe' is possibly the best known of the few which were sparingly disseminated in this country and 'Hassan' is one which may yet make a name for itself in the trade. Today the Seidel fields near Dresden are concealed

Photo Rudolph Henny

R. smirnowi, a relatively hardy species, grown by Rudolph Henny.

behind the iron curtain and Dietrich Hobbie in Oldenburg province is probably the leading German hybridist in the western zone. A commerical grower, Mr. Hobbie is raising over 100,000 seedlings from 500 or more crosses.

The climate in which he lives is milder than that of the northeastern United States but it is harsher than in England or on our Pacific Coast. Through the years Mr. Hobbie has accumulated hardier forms of the most ornamental species in much the same manner as has our own Joseph Gable. *R. wardii*, Sherriff 5679, and forms of *RR. wardii, decorum, puralbum* and *souliei* from the 1937 Professor Hu expedition have been especially useful for his climate.

Mr. Hobbie has probably exploited the dwarf *RR. repens* and *williamsianum* more than any other breeder. From six different forms of *R. repens* he has obtained many hybrids with *RR. chrysanthum, oreodoxa, catawbiense* var. *album Glass, catawbiense rubrum, traillianum* and with a number of the older English and Dutch cultivars. The free flowering seedlings in each cross have been distinctive but remarkably uniform in dwarf stature, desirable color and vigor. Each

form of *R. repens* imparts a different character to its progeny. Although all of them are slightly sensitive to winter sun, they are hardy enough to do well in Finland and there is a steadily increasing public demand for them in Germany. They bloom about the first of May. The best and hardiest of these various *repens* hybrids has been named 'Elizabeth Hobbie' and will be distributed by an American firm. It derived from a cross with 'Essex Scarlet.' Other good seedlings are R. ('Prometheus' x *repens)* 'Gertrude Schale' and R. ('Mrs. Butler' x *repens)*'Wega.'

Over 60 crosses have been made by Mr. Hobbie using *R. williamsianum* as the seed parent and fine, compact, dwarf hybrids with coral pink, light red, white and yellow flowers have resulted. Other species which he has employed are *RR. haematodes, discolor, scyphocalyx, brachycarpum, litiense, aperantum, herpesticum, metternichii* and *insigne* in combinations with various Waterers and Seidel hybrids, particularly 'Catherine van Tol,' 'Caractacus,' 'Madame Carvalho,' 'John Walter,' 'Vauban,' 'Madame Masson,' 'Edward S. Rand' and 'Mrs. P. den Ouden.'

R. wardii, Sherriff 5679, has proved to be an excellent parent, giving winter hardy seedlings which produce rich yellow flowers at an early age. Crossed with a hardy form of *R. discolor* obtained from Joseph Gable, it has produced seedlings of remarkable quality as has the same combination of species in England, there named 'Inamorata.' *R. wardii,* Prof. Hu 14757, crossed with R. souliei, gave compact, globular plants of nearly perfect growth habit.

In breeding Rhododendrons of larger stature Mr. Hobbie has much the same goals as do hybridists in the eastern United States except that he has a special interest in developing Rhododendrons which can tolerate slightly alkaline soil. He has crossed garden hybrids with species originating in lime-rich regions and at the present time some experiments at Munich are reported to be promising. A special effort has been made to create earlier blooming Rhododendrons and, unusual for a commercial grower, he has also been working to produce very late blooming hybrids. His preoccupation with *RR. repens* and *williamsianum* shows his particular interest in dwarf, compact plants.

Rhododendrons with scaly leaves seem to be generally neglected by hybridists throughout the world today, or at least they have not attracted the attention and imagination of breeders on any scale comparable to the lure of the elepidotes. The dwarf alpine sorts and the Triflorum group have produced some attractive Rhododendrons for

Photo Rudolph Henny

'Corona' has small flowers but a beautiful, tall truss. It has been used extensively as a parent by Rudolph Henny in whose garden this picture was taken.

English breeders and that fine hybrid. 'Ilam Violet,' came from Edgar Stead in New Zealand. Currently selections of *R. cinnabarinum* are being crossed in Britain in an effort to bring greater adaptability to the plants with their unique orange and pink bell-shaped flowers. Here in the United States, Joseph Casadevall in New Jersey has recently made a number of interesting and unusual lepidote crosses. And Edmond Amateis in New York now has at flowering age several combinations of species which had previously resisted all efforts to cross them. In 1954 I succeeded, with the aid of indolebutyric acid, in making certain crosses of species which heretofore have failed to set seeds.

In the wider domestic scene there exists no consistent pattern of effort or goal among American hybridists which is discernable to me. All, of course, mean to produce plants which are hardy for their conditions but there appear to be as many methods used in an effort to achieve that end as there are different breeders. The goals of the hybridists in the eastern United States are notably diverse. It is probably true that most amateurs have a special interest in producing Rhododendrons with yellow and orange flowers and that the breeders with a little more commercial pressure are preoccupied with the improvement of the red flowered hybrids. Beyond that, each hybridist seems to have picked his own primrose path to explore.

Considering the popularity of the single story house and the need for compact, dwarf Rhododendrons in the contemporary American landscape, it is remarkable that there exists no concerted effort to produce them. Most of the breeders have made sporadic crosses involving *RR. repens* and *williamsianum*, for example, but I know of none who has embarked on any program extensive or ambitious enough to be reasonably assured of filling this patent need.

In the eastern United States the fruits of our native breeders' work are just starting to be distributed. Two of Joseph Gable's hybrids, 'Caroline' and 'Beaufort,' have been introduced and they will be followed in the years ahead by many more. 'Ramapo' and the Guyencourt series, lepidote creations of Guy Nearing, have been disseminated to a limited extent. A systematic evaluation of the Dexter hybrids is being directed by John Wister in cooperation with the American Rhododendron Society at the Arthur Hoyt Scott Horticultural Foundation on the campus of Swarthmore College, Pennsylvania. Eventually, from the uncounted hosts of Dexter hybrid seedlings, a selection of the best of each color and blooming season will be made so that this pioneer breeder will be memorialized through the finest of his creations and not by the myriads of indifferent seedlings which have acquired his name.

Almost all of the standard Rhododendrons of the nursery industry in the eastern United States are Waterer hybrids introduced in this country in 1876. They have dominated the market ever since. Their enormous contribution to the gardens of the East can scarcely be overstated and all of us hold them in high affection. They have aged gracefully and now we hope to retire them to a distinguished position in the annals of horticulture as their descendants prepare to tread the public stage in a pageant even brighter, more colorful and more varied.

AMERICAN RHODODENDRON BREEDERS

The Dutch and English breeders have provided us with most of the named Rhododendron varieties presently being grown. Whether the present breeders in those countries will continue to turn out superior new things at the same rate as their predecessors, the Waterers, van Nes, Koster, Rothschild, Aberconway, etc., remains to be seen. Certain it is that the output of new Rhododendrons in this country is on the increase and American breeders have the advantage of working directly within the set of environmental conditions which their varieties will have to endure.

There will presumably never be another period such as the past century for the discovery of new species so future breeders will not be able to continue indefinitely to make new interspecific combinations. When we consider the matter mathematically, however, it is obvious that there are thousands of interspecific combinations which have never been made and there is no foreseeable limit to the possibilities of intercrossing hybrids. In other plant groups breeders have worked with a very few species, sometimes within a single species, to effect great improvement. The future of Rhododendron breeding, of producing better varieties, hardier, more beautiful, more fragrant, more pest resistant, of new and exciting color combinations, is practically unlimited. No one who would like to get into this exciting field for many years to come need feel that their opportunities are at all less than those of their predecessors.

In compiling the following information all known breeders were asked to answer a few questions and to submit the names of any other breeders they might know. Excellent cooperation was received for the most part although a very few did not send in the requested information and so reports of their work could not be included. There may be names which have been missed, for which we are sorry.

The individual accounts had to be brief but an attempt was made to include any information of special interest. In the case of some of the earlier breeders, now deceased, perhaps more space

Photo J. Harold Clarke

(Loderi G.) 'King George' in bloom in the Test Garden, Portland, Ore.

was taken than the relative importance of their contributions would justify, but it seemed that a fairly complete report would be desirable. The length of the account is not to be considered as an indication of the value of the work accomplished by current breeders.

It was felt that beginners in this field would like to know who the other breeders are and how they could be reached, even if they are just starting. Older breeders, in many cases have worked together to mutual advantage and the novice should be able to accomplish more by first surveying the work which has been done or is now in progress.

The parentage of the varieties mentioned in the following accounts is given, if known, in the list of American varieties.

FRANK L. ABBOTT

Breeding Rhododendrons and Azaleas "to stand Vermont climate, as low as —35°F" has been the goal of Frank L. Abbott of Saxton's River, Vermont. This is certainly one of the "furthest north" pro-

jects, climatologically speaking, even though the northern border of Vermont is south of the southern boundary of the state of Washington. Mr. Abbott, who started his breeding work in the spring of 1924, has grown and bloomed some 30,000 seedlings and now has about 10,000 under observation. He has also worked with azaleas and has named two. He has named one Rhododendron, 'Virgin', which is said to be one of the hardiest of all evergreen Rhododendrons.

ARTHUR D. ABELS

A recent addition to the ranks of Rhododendron breeders is Arthur D. Abels, Brewster, N. Y. who began in 1954 to work towards hardiness in the colder northeastern region.

EDMOND AMATEIS

The breeding work of Edmond Amateis, a well known sculptor, Brewster, N. Y. has taken two directions. On the one hand he has accomplished some new crosses in the lepidote groups, of which three names have already been accepted for registration in the R. H. S. Studbook, namely 'Dora Amateis' G., 'Louis Amateis' G., and 'Mildred Amateis' G. These are presumably somewhat tender. On the other hand, Mr. Amateis, who began breeding in 1948, has been interested in producing plants of extreme hardiness but of better color and habit than those now available. He has three selections which show special promise and some 1,000 plants are under observation. Mr. Amateis has been interested in the introduction of some of the Dexter varieties and has furnished descriptions of two, 'Dexter's Favorite' and 'Dexter's #9.'

JOHN G. BACHER

Many phases of horticulture have played a part in the life of John G. Bacher of 1920 N. E. Seventh Ave., Portland, Ore. as indicated by the honors which have come to him in other fields as well as the Rhododendron field. He was chairman of the Portland Rhododendron Test Garden committee during the critical period when the Garden was being designed and established. On March 17, 1955 he received a Citation and Honorary Life Membership in the American Rhododendron Society. His Rhododendron breeding work began in 1924 with special emphasis on early flowering forms. Some 3,000 seedlings have been raised to blooming stage and about 400 are still under test. At the 1955 A.R.S. Show in Portland, Mr.

Bacher brought in some fine specimens and three were given Preliminary Awards. These were subsequently named 'Bacher's Gold' P. A., 'Bern' P. A. and 'Geneva' P. A.

WARREN BALDSIEFEN

Beginning in 1947, Warren Baldsiefen of Rochelle Park, N. J. has tackled some tough problems in breeding hardy with tender lepidote varieties and species. Although he says those crosses were failures, nothing is a failure in plant breeding which adds to our knowledge. Later crosses with Azaleas and with less difficult Rhododendron species and varieties have shown more promise of success, but so far only some very tentative selections have been made.

JAMES E. BARTO

The influence of the late James E. Barto, of Junction City, Oregon, on the development of Rhododendrons in the Northwest is something that will be hard to evaluate for many years, but we do know that it has been very important. Few of our present A. R. S. members knew him personally. Apparently his death on Dec. 22, 1941, came at a time when his breeding work was just well started, after a period of accumulation, during which he gathered together more than 500 species of Rhododendrons and Azaleas. He was on the list of such explorers as Forrest, Kingdon Ward, Rock, Hu, Wu, Wada, etc. and had obtained seeds and pollen from English breeders such as Rothschild and Magor. He was a member of the Rhododendron Association of England in 1927 and probably began his breeding work about that time. His records were apparently lost in a fire which destroyed home and greenhouses. After his death the plants were sold out over a period of years although some may still remain in the old nursery area. These plants, most of them apparently without labels, were widely distributed so that many gardens in the Northwest contain "Barto" plants. As Mr. Del James says in the A.R.S. Bul. for Apr., 1950, "In all my visits to gardens in Oregon, Washington and California, I have yet to see a garden that did not have plants from Barto." So far as we know Barto did not name any varieties but at least four of his selections have been named by others, 'Esquire', by Mr. Del James, 'James Barto' P. A. by Mr. Clarence Prentice, 'Peachblow' by Mr. Arthur Wright, and 'Renaissance' by Mrs. Horace Fogg of Tacoma, Wash.

ROBERT M. BOVEE

Starting in 1950 Mr. Robert M. Bovee, of Oswego, Oregon, has been working for better dwarf varieties. One clone has been named 'Glow'.

DR. CLEMENT GRAY BOWERS

The author of two books and numerous magazine articles on Rhododendrons and Azaleas. Dr. Clement Bowers, of Maine, New York, has not only studied the known species and varieties of the genus but has tried to improve the Maximum and Catawbiense races by his own hybridizing. Starting in 1926 at the New York Botanical Garden, he has made about 500 successful hybrid combinations between these and many exotic species from which approximately 3,000 seedlings are still under observation. These are growing at various places, as Cornell University, University of Washington Arboretum, Farmingdale Institute for Applied Agriculture, and Planting Fields Arboretum on Long Island, N. Y. This work has been mainly exploratory and has been directed toward establishing original bases, by making new hybrid combinations, upon which new races of "ironclad" Rhododendrons may later be built. His principal objective is improved material for the sub-zero regions of the Northeast. Some selections are being studied for further breeding but none have been named. Dr. Bowers has also made scientific studies and has written papers on the pollen morphology of Rhododendrons, their sterilities, and various laboratory techniques used in breeding Rhododendrons, including the preservation of live Rhododendron pollen.

LESTER E. BRANDT

Better Rhododendrons for the Northwest, and especially better dwarf types, has been the objective of Lester E. Brandt, Rt. 5, Box 542, Tacoma, Washington. Working since 1940, he has made many crosses and now has some 50,000 seedings to select from. Approximately 5,000 have already flowered and several varieties have been named, including one which received the Preliminary Award in 1955. (Dream Girl G.) 'Mohur' P. A. Mr. Brandt has worked some with Azaleas and has named one Azaleodendron 'Avita'. He has named one other Rhododendron clone, (Dream Girl G.) 'Ophir'. He has also made a number of original crosses to which he has given group names as follows: 'Blood Ruby' G., 'Dream Girl' G., 'Helen' G., 'Little Joe' G., 'Moukoense' G., 'Nectarine' G.,

'Othello' G., 'Thalia' G. Most of these are registered in the R.H.S. Stud Book.

JOSEPH CASADEVALL

Located at Paterson, N. J. on the Newark—Pompton Turnpike, Mr. Joseph Casadevall has been working for new colors and larger flowers, plus hardiness, with both Rhododendrons and Azaleas. He has bloomed over 500 seedlings but none have been named.

ROY W. CLARK

Better dwarf and standard varieties of Rhododendrons has been the objective of Mr. Roy W. Clark, 2101 Olympia Ave., Olympia, Washington. He began hybridizing in 1945, has named a number of varieties, and now has a large number of seedlings under observation. Varieties named include: 'Aunt Martha', 'Jezebel', 'Lake Ozette', 'Olympic Blondie', 'Olympic Brave', 'Olympic Brownie', 'Olympic Chimes', 'Olympic Chinook', 'Olympic Hose in Hose', 'Olympic Hunter', 'Olympic Knight', 'Olympic Lady' G., (seed from Ostbo). (Olympic Lady G.) 'White Olympic Lady', 'Olympic Maid', 'Olympic Miss', 'Olympic Quinalt', 'Olympic Sweetheart'. 'Puget Sound', and Skokomish'. All of these are clones with the exception of 'Olympic Lady'.

DR. WILLIAM L. CORBIN

Starting his breeding work in 1947, Dr. Corbin of Portland, Oregon, has bloomed some 200 seedlings in search of better late flowering, heavy textured yellows and oranges. He has also done some work with azaleas.

C. O. DEXTER

Like Mr. James Barto of the west coast, Mr. C. O. Dexter of Sandwich, Mass., accumulated a fine collection of Rhododendron species, made numerous crosses, and then passed away before he could carry his work to completion or even make many specific selections. He had retired from business and built a home on Cape Cod about 1928. His landscape architect, Paul Frost of Cambridge, Mass., worked into the planting design a number of rare Rhododendron species and varieties. Among these were a few unnamed plants, probably hybrids of the Fortunei Series, acquired nearby but supposed to have come originally from Veitch's in England.

Photo Cecil Smith

R. ciliatum, hardiest of the Maddenis, in garden of Cecil Smith, Aurora, Ore.

Mr. Dexter, inspired by the beauty of the flowers and by a visit from E. H. Wilson, the noted plant explorer, soon began hybridizing on a large scale, using the Veitch plants as the principal basis for his work. By 1928 he was setting out yearly some 10,000 Rhododendron and Azalea seedlings besides many mixed seedlings of additional species out of seed secured from the best gardens of England. Many hundreds of plants were given away to friends, mostly as small seedlings, where they have been grown as Fortunei Hybrids. The more important collections of Dexter hybrids are presently those at the Arthur Hoyt Scott Foundation, Swarthmore College, Pennsylvania, at the New York Botanical Garden, and at the Arnold Arboretum. Smaller collections include those of Henry DuPont, Winterthur, Delaware, the Morris Arboretum, Philadelphia, the W. R. Coe estate, Planting Fields, near Oyster Bay, Long Island, and the B. P. P. Moseley estate near Boston. The originator's own stock at Sandwich, Mass. has been largely scattered since Mr. Dexter's death. Also the collection of Dexter seedlings belonging to the late Mr. Samuel Everitt, of Huntington, Long

Island, has mostly been dispersed. A small collection of Dexter's early selections is in the University of Washington Arboretum, at Seattle. In early 1950 it was recognized that valuable plants for eastern conditions were growing in the various collections and that something should be done about it. Accordingly an unofficial committee took form to look over the collections, make selections of superior clones and make arrangement for their propagation. This committee, which has met several times during the intervening years, includes Dr. Clement Bowers, Maine, N. Y., Dr. Donald Wyman, the Arnold Arboretum, Dr. Henry Skinner, the National Arboretum, Dr. John C. Wister, Swarthmore College, and Mr. Paul Vossberg, of Westbury, Long Island. Mr. Samuel Everitt acquired a quantity of small seedlings from Mr. Dexter, made a few selections and eventually layered and distributed a few of them. Mr. Everitt, as indicated in "Plants and Gardens" for April, 1949, gave the name 'COD' to one of these seedlings. He further states, without saying whether the names were his own, were Dexter's or were applied by some of his friends after his death, that, "Other named varieties include 'Peter Koster', 'Ashes of Roses', and 'Tan', but none of them has been introduced into the trade as yet". There is a 'Peter Koster' listed in the R. H. S. Handbook, presumably another and previously named variety. Recently Mr. Edmond Amateis has named 'Dexter's Favorite' which was Dexter's No. 123. 'Dexter's No. 9' presumably one of the original Veitch plants is being introduced by Mr. Warren Baldsiefen of New Jersey. Probably additional varieties will eventually be named as there are some fine looking Rhododendrons which should be quite valuable if they prove hardy enough for general culture in the Middle Atlantic and southern New England states.

JOHN S. DRUECKER

Plants more adaptable to various California climatic conditions are being sought by Mr. John S. Druecker of Fort Bragg, Cal. He has bloomed about 200 seedlings and has some 45 selections under test. One clone, grown from seed supplied by Mrs. Bowman, wife of Dr. Paul Bowman, has been named 'Ruby F. Bowman' P. A. The P. A. was awarded in 1951 at the Portland show.

BERNARD J. ESCH

Better pinks and reds that will bloom as very young plants and

bloom regularly have been the aim of Bernard J. Esch, 4105 S. E. Kelly St., Portland, Oregon. Breeding work was started in 1940. Some 200 seedlings have been bloomed and half a dozen are still under test. Two of the Esch seedlings have received the Preliminary Award, 'Pink Mermaid' P. A. and 'Merle Lee' P. A.

HERBERT J. FOWLE

Mr. Herbert J. Fowle, Newburyport, Mass., has been breeding both Rhododendrons and Azaleas since 1946. His special objective, so far as Rhododendrons is concerned, has been a bright yellow flowered variety. He has bloomed about 200 seedlings and now has 25 selections under test, including some Azaleodendrons.

JOSEPH B. GABLE

The Dean of American Rhododendron hybridizers is Joseph B. Gable of Stewartstown, Pa. who became interested in the genus when, as an army bandsman in 1918, he stopped for a brief rest period by the Hillier Nursery in England. Handing his bass horn to a buddy he ran back to the gate and for a few brief moments drank in the beauty of Rhododendrons in bloom and has been living in a Rhododendron world more or less ever since. Returning to his southeastern Pennsylvania home he began to collect varieties wherever he could get them and species from some of the great plant hunting expeditions of that era to which he subscribed. It was not long before he began to make crosses, hoping to combine the size of flower and other characteristics of the many tender, exotic things from the Far East with the hardiness necessary to survive in Pennsylvania's below zero winters. Mr. Gable has worked steadily, making numerous crosses in the Azalea Series as well as in many other Rhododendron Series and has named a large number of varieties in each group. He has always been alert to new types which might be used as parents even though many of them were "long shots" which would have discouraged a less dedicated and determined man.

Mr. Gable is the holder of the American Rhododendron Society Gold Medal, awarded Feb. 6, 1953, "in acknowledgment of 30 years of accomplishment in the investigation and hybridization of the Rhododendron genus."

Several of Gable's crosses are registered with the R.H.S. and appear in the Stud Book; such names are marked with a "G" in the following list. The following list may not be perfect

as in the many years of work, at first primarily for his own amusement, names were occasionally used for his own information and then dropped. They are not included in this list, although it is possible that some of them may appear in connection with some plant given away years ago and long forgotten. The following list does not include the numerous azalea varieties Mr. Gable has named: 'Albert Close,' 'Atroflo,' 'Beaufort,' 'Cadis,' 'Camich,' 'Carotid,' 'Caroline,' 'Catalgla' (Catawbiense album Glass), 'Catalode,' 'Codorus' G., 'Conestoga' G., Conemaugh' G., 'Conewago' G., 'Conewingo' G., 'Conococheague' G., 'Coplen's White,' 'Disca,' 'Gable's Pink No. 1,' 'Gable's Pink No. 2,' 'Gretchen,' 'Katherine Dalton,' 'Ladifor,' 'Madonna,' 'Maxie,' 'Mayflower,' 'Mrs. Carter Glass,' 'Mucram,' 'Sir James,' 'The Cardinal,' 'Three Star,' 'William Montgomery.'

MRS. E. J. GREIG

The Greigs, who have been growing dwarf species for many years have also been doing some breeding work in both the Rhododendron and Azalea groups. One Rhododendron clone has been named 'Edith Berkeley.' Mrs. Greig would especially like to produce better hardy, dwarf yellows, but she has been critical and has discarded most of the seedlings. Her home is at Royston, B.C. on Vancouver Island.

LESLIE HANCOCK

Another Canadian breeder is Mr. Leslie Hancock, of Cooksville. Ontario. He started breeding azaleas in 1942 and later branched off into Rhododendron and Azaleodendron crosses. He has raised some 300 seedlings, with 7 selections now under test in a search for the hardiest possible Rhododendrons for eastern North America.

DONALD L. HARDGROVE

Of over 500 different crosses which Donald Hardgrove, 100 Grace Ave., Merrick, Long Island, N.Y., has made, many were designed to further a breeding line and produce plants which could later be used as parents. Most of the seedlings he is now growing, the result of useing these selected parents, have four, five, and sometimes even six different species in the parentage resulting in greater variability and hence greater likelihood of superior forms appearing. One notable feature of his crosses is that in nearly all cases a fully hardy species is incorporated somewhere in the breeding. Some 14,000 seedlings are now under observation of which about 700 have bloomed.

Lines which Mr. Hardgrove is following, and which already show evidence of success, have as their goals, hardy yellows, hardy plants in shades of orange and salmon, better hardy reds with dwarf spreading growth habit, and lepidote varieties combining bushy, hardy plants with superior flower characters. Five clones have already been named and several others, under number, are being propagated, one of which was awarded "best of show" at the 1955 New York Chapter Show. The named varieties are as follows: 'Crimson Star,' 'Painted Star,' 'Purple Gem,' 'Springsong,' and 'Starlight.'

DR. CARL G. HELLER

Starting work in 1949, Dr. Heller of Portland, Oregon, has bloomed about 50 plants. His particular interest is plants with good blooms but better foliage and habit than existing varieties.

JOHN HENNY

Working since 1938 John Henny, Brooks, Oregon, has made some 25 to 30 crosses and has grown about 1000 seedlings to blooming size. Specific objectives have been better low growing garden plants and better dwarfs. One variety 'Full Moon' has received a Preliminary Award. Other varieties named have been 'Glowing Embers,' a clone of the 'Theresa' group, (Margaret Dunn G.) 'Talisman' and (Margaret Dunn G.) 'Golden Belle.'

RUDOLPH HENNY

Over 20,000 seedlings have been grown by Rudolph Henny, Brooks, Oregon, who began his breeding work in 1940. He has had a minor interest in Azaleas but most of his crosses have involved some of the best of the Dutch and English hybrid Rhododendrons. Some 300 selections are now under test but at this writing none of his varieties have been distributed. A number of Mr. Henny's selections have been given Preliminary Awards as follows: 'Stop Light' P.A. (1951), 'Voodoo' P.A. (1952), 'Grace' P.A. (1952), 'Little Pudding' P.A. (1953), 'Red Cloud' P.A. (1953), 'CIS' P.A. (1953), 'Little Sheba' P.A. (1954), 'Lake Labish' P.A. (1955), 'Moontide' P.A. (1955). Other clones named by Mr. Henny include 'Cathy,' 'Cavalier,' 'Cheerio,' 'Doll,' 'Dr. Ross,' 'Ella,' 'Forest Fire,' 'Goldbraid,' 'Goldbug,' 'Griselda,' 'Highnoon,' 'Hoopskirt,' 'Hotshot,' 'Jade,' 'Kismet,' 'Lemon Bells,' 'Leona,' Lipstick,' 'Maryann,' 'Mirage,' 'Mitzi,' 'Pow Wow,' 'Quinella,' 'Red Snapper,' 'Red Tape,' 'Solitude,' 'Sunset,' 'Tatoosh,' and 'Yellow Jacket.'

Photo Cecil Smith

R. tephropeplum in Cecil Smith's garden.

DEL W. JAMES

For many years Mr. Del W. James, 2008 Floral Hill Drive, Eugene, Oregon, has been collecting fine and unusual things from England, from the Barto Nursery and elsewhere. In 1945 he began making crosses, with both Rhododendrons and Azaleas, hoping especially to produce a better yellow Rhododendron with a good truss and a wide open, flat flower. He has bloomed about 200 seedlings and now has some 300 coming along. Among the varieties he has named is 'Esquire,' a seedling of unknown parentage from the Barto collection. Of his own crosses the following have received Preliminary Awards: 'Fawn,' P.A. 'Renhaven' P.A., 'Sharon' P.A., and 'Tumalo' P.A. An unnamed selection of *R. pseudoyanthinum* has received a P. A., subject to naming. Other varieties named include 'Loderi Sue,' 'Tolo,' 'Towhee,' and 'Umpqua Chief.' All of these varieties are clones.

DR. E. J. KRAUS

Although working mostly with Azaleas Dr. E. J. Kraus, at Oregon State College, Corvallis, Oregon, has made some Azaleodendron

crosses. After having achieved an enviable reputation as a breeder of Chrysanthemums and Hemerocallis, Dr. Kraus has only recently (1952) turned his attention to the Genus Rhododendron.

BEN LANCASTER

Since 1940 Ben Lancaster, Camas, Washington, has been breeding Rhododendrons for improved habits for landscape purposes. He has bloomed about 1500 from numerous crosses and now has approximately 100 selections under test, including 4 in the Test Garden at Portland. One clone has received a Preliminary Award, namely 'Rose Elf' P.A. Another clone, 'Snow Lady' P.A., shown by Mr. Lancaster but not of his breeding also received the same award. Other varieties named by Mr. Lancaster, all clones, include 'Allegro,' 'Americana,' 'Bluette,' 'Little Dragon,' 'Mission Bells,' 'Rom,' 'Signal,' and 'Vulcan's Flame.' He has also named a number of Azaleas, including a whole series with northwest Indian names, all *R. occidentalis* hybrids of his own breeding.

H. L. LARSON

For the last 15 years Mr. H. L. Larson, 1132 N. 26th St., Tacoma, Wash., has been endeavoring to produce better Rhododendrons. From his breeding efforts have come many interesting selections of which the following have been named, all clones: 'Diane Titcomb,' 'Julie Titcomb,' 'Mrs. Bernice Baker,' 'Mrs. Elizabeth Titcomb,' 'Mrs. Helen Weyerhauser,' 'Mrs. Horace Fogg,' 'Mrs. Paul B. Smith," and 'Virginia Scott.'

DAVID G. LEACH

The climatic conditions of the area in which he gardens have undoubtedly played a large part in determining the breeding objectives of Mr. David G. Leach of Brookville, Pa. He gives them as follows, "To produce hybrids of superior quality for very severe climates, able to endure 25 below zero without injury." Working since 1943 he has bloomed hundreds of seedlings of which 18 have been selected as worthy of further testing, which will involve growing them until they have survived several real 'test winters.' Mr. Leach has also been working with Azaleas.

HALFDAN LEM

While living in Alaska Mr. Halfdan Lem had become interested in Rhododendrons and secured several plants from Mr. Gable. Soon

afterwards he brought his Rhododendrons to Seattle, where he now lives at 19215 Aurora Ave. One cannot help wondering what might have resulted if he had gone in for Rhododendron breeding in Alaska as enthusiastically as he has in the States. His first hybridizing was in 1934 and was followed by more breeding each year until over 1000 different crosses had been made. More than 500 of his own seedlings have bloomed besides a great number from English seed, and there are now in all stages of development over 100,000 more to be grown on, studied and evaluated. Three of his selections have received the Preliminary Award, subject to naming, as follows: a selection of his 'Anna' group, one from his 'Lem's Goal' group, and a seedling known as No. 49. Mr. Lem has named two clones 'Burgundy' and 'Ole Olson,' the latter a seedling coming originally from Gable, and 5 group varieties, 'Anna' G., 'Darlene' G., 'Flame' G., 'Lem's Goal' G., and 'Pera' G. The first three of these group varieties were grown from seed secured from Mr. Rose of England.

FRANK MORGAN

The late Frank Morgan of Hoquiam, Washington, acquired his first Rhododendron plants about 40 years ago. He is said to have made many crosses but few details are now available. His complete collection, some 9,000 plants, is now in the hands of Mr. Prentice of Seattle.

BRIAN O. MULLIGAN

In 1947 Mr. Brian O. Mulligan, Director of the University of Washington Arboretum in Seattle, began hybridizing to produce improved early flowering types and new dwarf hybrids, especially interspecific. One variety has been named, 'Seattle Springtime' G., and progenies of several crosses are being grown.

G. G. NEARING

Many years in the cause of better Rhododendrons have been put in by Guy Nearing, Ramsey, New Jersey, since he started breeding about 1928. His most important objective is hardiness and so he has purposely exposed most of the approximately 150,000 seedlings he has raised to winter cold while they were still small, thus being able to eliminate a large portion of them without field trials. Most of his crosses involve 4 species, usually 1 hardy and 3 very fine with respect to flower characters but not as hardy. A flood in 1945 practically wiped out Mr. Nearing's nursery at Ridgewood, N.J. His breed-

ing material was so depleted, some 10,000 plants being lost, that he abandoned the Rhododendron field for a short time but started again in 1950, some 22 years after his first crosses had been made. A less critical breeder over this period would probably have named a much larger number than has Guy Nearing, only 10, and he has been working almost 30 years. His conservatism in this respect is something to be considered thoughtfully by breeders who are just beginning and who may tend to be impatient for results. Clones which he has named include the following: 'Beatrice Pierce,' 'Ramapo,' 'Windbeam,' 'Wyanokie,' and half a dozen grouped under the general name of Guyencourt Hybrids, namely 'Brandywine,' 'Chesapeake,' 'Delaware,' 'Hockessin,' 'Lenape,' and 'Montchanin.'

ENDRE OSTBO

Since 1938 Mr. Endre Ostbo, 2016 Lake Washington Blvd., Bellevue, Washington, has been working to improve Rhododendrons, first with plants grown from seed he secured from England, and then with plants from his own crosses. Several thousand seedlings have been raised and several hundred have bloomed. Only two clones have been named, 'Mrs. Donald Graham' P.A. and 'King of Shrubs' P.A., the latter being the first variety to receive an A. R. S. Award. It is indicative of Mr. Ostbo's belief in thorough testing that he has received Preliminary Awards, subject to naming, on four additional seedlings, one an Azaleodendron, which are being grown under number until he feels they are worthy of naming and introduction.

SAMUEL B. PARSONS

Credit for being the first American Rhododendron "breeder" probably should go to Mr. Samuel B. Parsons, although whether the varieties he introduced were the result of hybridization or were simply chance seedlings is not clear. Some were apparently Waterer seedlings from England and just named by Parsons. Mr. Parsons operated the Kissena Nurseries at Flushing, Long Island, N.Y. Mr. E. S. Rand, author of the first American book on Rhododendrons, "The Rhododendron and American Plants," published in 1871, says that thousands of seedlings were being grown in the Parsons Nursery. He lists one variety as having been named 'Bertie Parsons' so the breeding work or raising of chance seedlings must have begun several years before 1871. Dr. John Wister has compiled a "Preliminary Check List of Hardy Hybrids and Clones" which lists the following varieties as coming from Parsons, with the notation that 'Parson's

Photo Rudolph Henny

This is the F.C.C. form of 'Lady Bessborough' G. as grown by Rudolph Henny, Brooks, Ore.

Gloriosum' was introduced before 1860. 'Abraham Lincoln,' 'Amaranthora,' 'Anna Parsons,' 'Bertie Parsons,' 'Daisy Rand,' 'Flushing,' 'General Grant,' 'Henry Probasco,' 'J. R. Trumpy,' 'Kissena,' 'Lilacina,' 'Lionel,' 'Mable Parsons,' 'Maximum superbum,' 'Osceola,' 'Parsons Gloriosum,' 'Parsons Grandiflorum,' 'Pocahontas,' 'President Lincoln' (syn. 'Herbert Parsons,' 'Bertha Parsons,' 'Betsy Parsons'), 'Purpureum Crispum,' 'S. B. Parsons,' 'Senator Charles Sumner,' 'Tecumseh.'

JULIAN POT

Azalea, Rhododendron and Azaleodendron crosses have been made by Mr. Julian Pot, Chesterland, Ohio, who began hybridizing in

1928. Several hundred seedlings have bloomed and more are coming along. He has used several of the old "ironclads" as parents, as well as some species. He has some good seedlings but none have been named.

CLARENCE PRENTICE

Although he has been interested in Rhododendrons for many years Mr. Clarence Prentice, 9253 East Marginal Way, Seattle, Wash., did not begin breeding in an intensive way until 1951. At the present time, however, he has some 40,000 seedlings under test. Mr. Prentice has been active in finding, and bringing under his own observation, seedling Rhododendrons from other breeders. He now has, for instance, some 9,000 seedlings from the breeding of the late Frank Morgan. One of the plants he secured from the estate of the late James Barto he has named 'James Barto' and it has since received a P. A. Another selection, which he calls Elliotti No. 4, seed from Herb Ihrig, has also received a P.A. subject to naming. He has named another clone 'Debbie,' the plant having come as a seedling from John Henny.

ORLANDO S. PRIDE

In his hybridizing work with both Rhododendrons and Azaleas, Orlando S. Pride, Butler, Pa., has bloomed some 16,000 plants and has over 50 unnamed selections under test. His work with Rhododendrons has been directed towards ironclad hardiness. He has named 16 varieties of Azaleas but, up to this time, no Rhododendrons.

MISS JOAN A. RUGER

Miss Joan A. Ruger of Brewster, N. Y., has recently made several crosses between old hardy varieties and some of the more tender sorts with better flower characters. She is particularly interested in hardy plants suitable for foundation planting.

A. M. SHAMMARELLO

Rhododendron breeders are few and far between in the Great Lakes area. It is somewhat unusual, therefore, to find a man in northern Ohio who has bloomed 10,000 seedlings and from that array has selected about 200 for further testing. And yet that is what Mr. A. M. Shammarello, 4590 Monticello Blvd., Euclid, Ohio, has done during the last 15 years. He has worked particularly

to produce dwarf, hardy Rhododendrons in red and pink colors, and has also been hybridizing Azaleas. Among the varieties he has used as parents are several of the old "ironclads." Varieties named but not yet distributed include 'Belle Heller', 'Cheer', 'Elie', 'Holden', 'King Tut', 'Pink Cameo', 'Pinnacle', 'Prize', 'Rocket', 'Ruby', 'Satin', 'Spring Glory', 'The General', and 'Tony.'

DR. HENRY T. SKINNER

While at Cornell University, Dr. Skinner raised 1000 seedlings of *R. mucronulatum*, from Japanese seed in search of possible "whites" but found a better pink instead. It was named 'Cornell Pink' and later distributed from the Morris Arboretum. Dr. Skinner now Director of the National Arboretum, Washington, D. C., began breeding Azaleas and Rhododendrons in 1936, working specifically for hardiness and ease of propagation. He now has some 6,000 seedlings under observation. One of his selections, original plant at the Morris Arboretum, has been named 'Gretchen Medlar'.

CECIL C. SMITH

Production of low growing varieties with good foliage and full truss has been the objective of Mr. Cecil Smith, R. 1, Aurora, Ore. He began breeding both Azaleas and Rhododendrons in 1951.

WARREN E. STOKES

About 25 years ago Mr. Warren E. Stokes of Butler, Pa., raised several hundred seedlings of Catawbiense hybrids, from which 5 were named, 'Ann Rutlidge', 'Ethel Roupe', 'Improved Parson's Grandiflorum', 'Indian Chief', and 'Newport.' These have not been distributed. More recently Mr. Stokes has been making crosses between various species of deciduous Azaleas, of which several hundred seedlings have been under observation.

MR. AND MRS. MAURICE H. SUMNER

In 1951 Mr. and Mrs. Sumner, 350 Edgehill Way, San Francisco, Cal., began crossing both Azaleas and Rhododendrons and now have some 2,000 seedlings under observation. A special goal is red, trumpet shaped flowers, with fragrance, from crosses with species of the Maddeni series.

MRS. B. E. TORPEN

About 250 seedlings have been raised to blooming size and 25 have been selected for further testing by Mrs. B. E. Torpen, 9945 S. W. Beaverton Hillsdale Highway, Beaverton, Ore.

THEODORE VAN VEEN

Mr. Van Veen, 3127 S. E. 43rd Ave., Portland has been making Rhododendron crosses since 1947. As parents he has used some of the better Dutch and English hybrids, some of the old "ironclads" and also some species. Clones named include 'Autumn Gold', 'Evening Glow', 'Lucky Strike', and 'Old Copper'.

W. E. WHITNEY

Since 1945, Mr. W. E. Whitney, 565 W. Third, Camas, Wash., has raised some 1,500 seedlings. One of these 'Anna Rose Whitney' has received a Preliminary Award. Two others which have been named are 'Fayetta' and 'Velma Rozetta'.

DR. JOHN C. WISTER

Back in 1940 Dr. John C. Wister began selection work with a group of the Dexter Rhododendrons and a collection of Azalea seedlings. His own breeding work started in 1953, designed especially to produce varieties flowering the first two weeks of June, during a gap in the present flowering season. He has bloomed some hundreds of seedlings and now has about 10,000 seedlings under observation. Dr. Wister is Director of the Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pennsylvania.

ARTHUR WRIGHT

After blooming some 1000 Rhododendron seedlings since 1946, Mr. Arthur Wright, Milwaukie, Oregon, has named 6 varieties, 'Lagoon', 'Moonrise', 'Peachblow', 'Puck', 'Tranquillity', and 'Twinkles'. 'Peachblow' came as an unnamed seedling from the Barto Nursery.

AMERICAN AZALEA BREEDERS, A PARTIAL LIST

No exhaustive effort was made to contact all Azalea breeders as the Azalea Handbook, published in 1952 by the American Horticultural Society, has covered that field. However, in attempting to find all Rhododendron breeders, we sent questionnaires to and received replies from several who are working only with the Azalea series of the genus, and we sincerely appreciate their cooperation. Since this book is featuring the breeding of Rhododendrons it seemed desirable to list herewith American Azalea breeders, past and present, in so far as we have the information. Those Azalea breeders who are also breeding Rhododendrons are not listed, as their interest in Azaleas has already been mentioned in the preceding pages.

Walter Allan, Box 446, Summerville, S. C.

Bobbink and Atkins, East Rutherford, N. J.

Julian Chisholm, Garrett Park, Md.

S. D. Coleman, Ft. Gaines, Ga.

The Coolidge Rare Plant Gardens, Pasadena, Cal.

Phillip B. Cornell, Rt. 1, Box 240, Fort Bragg, Cal.

Dr. John L. Creech, Plant Introduction Garden, Glenn Dale, Md.

Henry S. Dawson, Holleston, Mass.

Jackson T. Dawson, Arnold Arboretum, Jamaica Plains, Mass.

The Deerfield Nursery, Deerfield Street P. O., N. J.

Roland de Wilde, R. 1, Bridgeton, N. J.

T. D. Hatfield, Wellesley, Mass.

P. M. Koster, Bridgeton, N. J.

Dr. E. J. Kraus, Dept. of Horticulture, Oregon State College, Corvallis, Ore.

R. P. Mayo, Augusta, Ga.

Dr. E. A. Merritt, Chevy Chase, Md.

B. Y. Morrison, Plant Introduction Garden, Glenn Dale, Md.

Alphonse Pericat, Collingdale, Pa.

R. L. Pryor, U. S. D. A. Plant Industry Station, Beltsville, Md.

Charles Sander, Brookline, Mass.

K. Sawada, Crichton Station, Mobile, Ala.

Sherwood Nursery Co., 141 S. E. 65th Ave., Portland, Ore.

Guy E. Yerkes, U. S. D. A. Plant Industry Station, Beltsville, Md.

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

The names in the following list were obtained from the breeders themselves or from the literature. We are indebted to Dr. John Wister for the names of the Parsons varieties many of which probably are now lost to cultivation. The question might be raised as to whether such varieties are worth recording if no plants are known to exist. They are published partly as a historical record but primarily so that breeders may avoid using those names for new varieties. The International Code of Nomenclature and the A.R.S. Code of Nomenclature stress that variety names, once used, should not again be given to another variety of the same genus. There is always the possibility of the old variety still being grown somewhere and, if in existence, there is the chance it may be propagated again. Even if the old variety is completely lost, but it had been mentioned in some publication, and another plant is given the same name, anyone studying the records a few years later would probably have difficulty determining just which of the two is meant when the name appears in a list. There are several cases now where two existing varieties have the same name and it is necessary to state which is meant when discussing them.

A few of the names sent in by breeders were described as "not available," "not distributed," etc. It seemed best to include them, however, as they may have been given to friends, who may have given them to other friends. Or they may be distributed after the breeder has sold his property, or even after his death. Where breeders have specified that certain names are strictly for their own information, and will not be published, or used when selling or giving away plants, then they have been omitted.

The parentage is given in so far as possible, from the information available, with the female parent written first. Exact parentage is difficult to guarantee, unless considerable care is taken, as it is fairly easy for contamination to occur when the pollen is being applied, or for seed or seedlings to be mixed later. Occasionally breeders have given a formula which they think indicates the parentage, but they are just not sure. Most of the formulas given are probably accurate, however, as most hybridizers are quite painstaking in keeping their

Photo John Bacher

R. irroratum of the Irroratum series in the garden of John Bacher, Portland, Ore.

records. For many of the older varieties and some of the new ones the exact cross is unknown, but it may be evident that a particular species is involved. For such clones the terms Catawbiense Hybrid, Fortunei Hybrid, etc. are used to indicate the general group to which they belong.

Most of the American varieties are clones but a few which have been registered with the R.H.S. are considered as group varieties as, according to the British system, other breeders have the privilege of using the same name for their own seedlings of the same cross. A very few American breeders have followed the practice of actually selling seedlings of a particular cross under a "group" name. (See the A.R.S. Code of Nomenclature.) Most, however, have sold seedlings as "unnamed seedlings" or by a formula as "seedlings of species A X hybrid B."

Occasionally breeders obtain seed, or possibly seedlings, from someone else and find later that they have a clone worth naming. In the following list the name of the person who actually named the

variety is given first, and if it came from someone else, the name of the person from whom the seed or plant was obtained is also given.

The following have named varieties appearing in the list but are not included in the account of breeders, either because the necessary information was not available, or because they are not actually engaged in hybridizing. Hansen—Mrs. Ruth M. Hansen, Portland, Ore.: Everitt—Samuel Everitt, Huntington, L.I., N.Y.: McClure—Donald K. McClure, Seattle, Wash.: Vossberg—Paul D. Vossberg, Westbury, L.I., N.Y.: Fogg—Mrs. Horace Fogg, Tacoma, Wash.

Photo J. Harold Clarke

R. degronianum growing at the base of a tree in the rockery at the Test Garden, Portland, Ore. Flowers on this plant were a very pretty, soft pink.

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Abraham Lincoln	Catawbiense Hybrid	Cl	Parsons
Albert Close	*R. maximum* X 'Mrs. Jamie Fraser'	Cl	Gable
Allegro	'Azor' G. X (Loderi G.) 'King George'	Cl	Lancaster
Amaranthora	Catawbiense Hybrid	Cl	Parsons
Americana	'Britannia' graft sport	Cl	Lancaster
Anna	'Norman Gill' G. X 'Jean Marie Montagu'	G	Lem, seed from Rose
Anna Parsons	Catawbiense Hybrid	Cl	Parsons
Anna Rose Whitney P.A.	*R. griersonianum* X 'Countess of Derby' G.	Cl	Whitney
Ann Rutlidge	Catawbiense Hybrid	Cl	Stokes
Ashes of Roses	Fortunei Hybrid	Cl	Dexter ?
Atroflo	*R. atrosanguineum* X *R. floccigerum*	Cl	Gable
Aunt Martha			Clark, plant from Morgan
Autumn Gold	*R. discolor* X 'Fabia' G.	Cl	Van Veen
Avita (Azdn)	*R. occidentale* X 'Margaret Dunn' G.	Cl	Brandt
Bacher's Gold P.A.	'Unknown Warrior' X 'Fabia' G.	Cl	Bacher
Beatrice Pierce	*(R. decorum* X *R. aucklandii)* X 'Charles Dickens'	Cl	Nearing
Beaufort	'Boule de Neige' X *R. Fortunei*	Cl	Gable
Belle Heller	'Catawbiense album' X white Catawbiense seedling	Cl	Shammarello
Bern P.A.	*R. decorum* X ?	Cl	Bacher
Bertie Parsons	Catawbiense Hybrid	Cl	Parsons
Blood Ruby	*R. forrestii* var. *repens* X 'Mandalay' G.	G	Brandt
Blue Cloud	*R. Chasmanthum*	Cl	Hansen
Bluette	*R. impeditum* X *R. augustinii*	Cl	Lancaster
Brandywine	*R. pubescens* X *R. keiskei*	Cl	Nearing
Burgundy	'Britannia' X 'Purple Splendour'	Cl	Lem
Cadis	'Caroline' X *R. discolor*	Cl	Gable

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Camich	*R. catawbiense* X 'Michael Waterer'	Cl	Gable
Caprice	*R. augustinii*	Cl	Hansen
Carolid	(*R. carolinianum X R. oleifolium*) X *R. davidsonianum*	Cl	Gable
Caroline	Decorum Hybrid ?	Cl	Gable
Catalgla	*R. Catawbiense album* Glass	Cl	Gable
Catalode	'Catawbiense album' X 'Loderi' G.	Cl	Gable
Cathy	'Corona' X 'Dondis' G.	Cl	R. Henny
Cavalier	'Pygmalion' X 'Tally Ho' G.	Cl	R. Henny
Cheer	'Cunningham's White' X red Catawbiense seedling	Cl	Shammarello
Cheerio	*R. wardii* X 'Rosy Morn' G.	Cl	R. Henny
Chesapeake	*R. pubescens* X *R. keiskei*	Cl	Nearing
C I S, P.A.	'Loder's White' X 'Fabia' G.	Cl	R. Henny
C O D	Fortunei Hybrid ?	Cl	Everitt, plant from Dexter
Codorus	*R. racemosum* X. *R. minus*	Cl	Gable
Conemaugh	*R. racemosum* X *R. mucronulatum*	G	Gable
Conestoga	*R. carolinianum* X *R. racemosum*	G	Gable
Conewago	*R. carolinianum* X *R. mucronulatum*	G	Gable
Conewingo	*R. haematodes* X *R. diphrocalyx*	G	Gable
Conococheague	*R. catawbiense* X *R. haematodes*	G	Gable
Coplen's White	Catawbiense Hybrid	Cl	Gable
Corinne	'Vulcan' G. selfed	Cl	McClure, plant from Lem
Cornell Pink	*R. mucronulatum*	Cl	Skinner
Crimson Star	'Britannia' X 'Unknown Warrior'	Cl	Hardgrove
Daisy Rand	Catawbiense Hybrid	Cl	Parsons

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Darlene	*R. griersonianum* X 'Armistice Day'	G	Lem, seed from Rose
Debbie	'May Day' G. X 'Carmen' G.	Cl	Prentice, plant from J. Henny
Delaware	*R. pubescens* X *R. keiskei*	Cl	Nearing
Dexter's No. 9	Fortunei Hybrid ?	Cl	Dexter, from Veitch (?)
Dexter's Favorite	Fortunei Hybrid ?	Cl	Amateis, plant from Dexter
Diane Titcomb	'Marinus Koster' X 'Snow Queen' G.	Cl	Larson
Disca	*R. discolor* X 'Caroline'	Cl	Gable
Doll	'Corona' X 'Dondis' G.	Cl	R. Henny
Dora Amateis	*R. carolinianum* X. *R. ciliatum*	G	Amateis
Dream Girl	'Day Dream' G. X 'Margaret Dunn' G.	G	Brandt
(Dream Girl G.) Mohur P.A.	'Day Dream' G. X 'Margaret Dunn' G.	Cl	Brandt
(Dream Girl G.) Ophir	'Day Dream' G. X 'Margaret Dunn' G.	Cl	Brandt
Dr. Ross	*R. griersonianum* X 'Borde Hill'	Cl	R. Henny
Edith Berkeley	*R. consanguineum* X [(Loderi G.) 'King George' X *R. auriculatum*]	Cl	Greig
Elie	pink Catawbiense seedling X pink Catawbiense seedling	Cl	Shammarello
Ella	*R. dichroanthum* X *R. wardii*	Cl	R. Henny
Esquire	Chance seedling	Cl	James, plant from Barto
Ethel Roupe	Catawbiense Hybrid	Cl	Stokes
Evelyn	(Loderi' G.) 'Venus' X 'Britannia'	Cl	R. Henny
Evening Glow	*R. discolor* X 'Fabia' G.	Cl	Van Veen
Fawn P.A.	*R. fortunei* X 'Fabia' G.	Cl	James

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Fayetta	'Tally Ho' G. X 'Golden Horn' G.	Cl	Whitney
Flame	('Loderi' G. X 'Corona') X *R. griersonianum*	G	Lem
Flushing	Catawbiense Hybrid	Cl	Parsons
Forest Fire	'Tally Ho' G. X 'Britannia'	Cl	R. Henny
Full Moon P.A.	'Hawk' G. X 'Adriaan Koster'	Cl	J. Henny
Gable's Pink No. 1	*R. atrosanguineum* X *R. fortunei*	Cl	Gable
Gable's Pink No. 2	*R. discolor* X 'Caroline'	Cl	Gable
General Grant	Catawbiense Hybrid	Cl	Parsons
Geneva P.A.	'Unknown Warrior' X 'Fabia' G.	Cl	Bacher
Glowing Embers	'Romany Chal' G. X *R. griersonianum*	Cl	J. Henny
Glow	*R. griersonianum* X 'Armistice Day'	Cl	Bovee
Gold braid	'Fabia' G. X 'Dondis' G.	Cl	R. Henny
Goldbug	*R. croceum* X 'Fabia' G.	Cl	R. Henny
Golden Belle	See (Margaret Dunn G.) 'Golden Belle'		
Grace P.A.	'Loderi' G. X 'Borde Hill'	Cl	R. Henny
Gretchen	(*R. decorum* X *R. griffithianum*) X 'Kettledrum'	Cl	Gable
Gretchen Medlar	'Boule de Neige' X 'Henrietta Sargent'	Cl	Skinner
Griselda	'Fabia' G. X. 'Margaret Dunn' G.	Cl	R. Henny
Helen	*R. decorum* X 'Souldis' G.	G	Brandt
Henry Probasco	Catawbiense Hybrid	Cl	Parsons
Highnoon	'Earl of Athlone' X 'Fabia' G.	Cl	R. Henny
Hockessin	*R. pubescens* X *R. keiskei*	Cl	Nearing
Holden	'Cunningham's White' X red Catawbiense seedling	Cl	Shammarello

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Hoopskirt	'Rosy Morn' G. X 'Dido' G.	Cl	R. Henny
Hotshot	*R. eriogynum* X 'Mars'	Cl	R. Henny
Improved Parson's Grandiflorum	Catawbiense Hybrid	Cl	Stokes
Indian Chief	Catawbiense Hybrid	Cl	Stokes
Jade	'Fabia' G. X 'Corona'	Cl	R. Henny
James Barto	? *R. williamsianum* X *R. orbiculare*	Cl	Prentice, plant from Barto
Jezebel	'Fabia' G. X ?	Cl	Clark
J. R. Trumpy	Catawbiense Hybrid	Cl	Parsons
Julie Titcomb	'Marinus Koster' X 'Snow Queen' G.	Cl	Larson
Katherine Dalton.	*R. smirnowii* X *R. fortunei*	Cl	Gable
King of Shrubs P.A.	? Seed from England	Cl	Ostbo
King Tut	red Catawbiense seedling X red Catawbiense seedling	Cl	Shammarello
Kismet	'Grenadier' G. X 'Pygmalion'	Cl	R. Henny
Kissena	Catawbiense Hybrid	Cl	Parsons
Ladifor	'Lady Clementine Mitford' X *R. fortunei*	Cl	Gable
Lagoon	*R. augustinii*	Cl	Wright
Lake Labish P.A.	'Lady Bligh' X (Loderi G.) 'Venus'	Cl	R. Henny
Lake Ozette	*R. griersonianum* X (Loderi G.) 'Venus'	Cl	Clark
Lemon Bells	*R. decorum* X 'Fabia' G.	Cl	R. Henny
Lem's Goal	'Ole Olson' X 'Azor' G.	G	Lem
Lenape	*R. pubescens* X *R. keiskei*	Cl	Nearing
Leona	'Corona' X 'Dondis' G.	Cl	R. Henny
Lilacina	Catawbiense Hybrid	Cl	Parsons
Lionel	Catawbiense Hybrid	Cl	Parsons
Lipstick	'Fabia' G. X 'Dondis' G.	Cl	R. Henny
Little Dragon	'Fabia' G. X. *R. venator*	Cl	Lancaster
Little Joe	*R. forrestii* var. *repens* X 'May Day' G.	G	Brandt
Little Pudding P.A.	*R. decorum* X 'Fabia' G.	Cl	R. Henny

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Little Sheba P.A.	('Earl of Athlone' X 'Fabia' G.) X *R. forrestii* var. *repens*	Cl	R. Henny
Loderi Sue	(Loderi G.) 'King George' selfed	Cl	James
Louis Amateis	*R. carolinianum* X *R. bullatum*	G	Amateis
Lucky Strike	*R. griersonianum* X 'Countess of Derby' G.	Cl	Van Veen
Mable Parsons	Catawbiense Hybrid	Cl	Parsons
Madonna	*(R. decorum* X *R. griersonianum)* X 'America'	Cl	Gable
(Margaret Dunn G.) Golden Belle	*R. discolor* X 'Fabia' G.	Cl	J. Henny
(Margaret Dunn G.) 'Talisman'	*R. discolor* X 'Fabia' G.	Cl	J. Henny
Mary Ann	'Corona' X 'Dondis' G.	Cl	R. Henny
Maxie	*R. maximum* X. *R. macrophyllum*	Cl	Gable
Maximum Superbum	Maximum Hybrid ?	Cl	Parsons
Mayflower	*R. racemosum* X *R. carolinianum*	Cl	Gable
Meadowbrook	'Mrs. C. S. Sargent' X 'Everestianum'	Cl	Vossberg
Merle Lee	'Azor' selfed	Cl	Esch
Mildred Amateis	*R. carolinianum* X *R. edgeworthii*	G	Amateis
Mirage	'Fabia' G. X 'Margaret Dunn' G.	Cl	R. Henny
Mission Bells	*R. williamsianum* X *R. orbiculare*	Cl	Lancaster
Mitzi	*R. croceum* X 'Fabia' G.	Cl	R. Henny
Mohur	see (Dream Girl G.) 'Mohur'		
Montchanin	*R. pubescens* X *R. keiskei*	Cl	Nearing
Moonrise	'Souvenir of W. C. Slocock' X (Loderi G.) 'King George'	Cl	Wright
Moontide P.A.	*R. wardii* X 'Loderi' G.	Cl	R. Henny
Moukoense	*R. pemakoense* X *R. moupinense*	G	Brandt

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Mrs. Bernice Baker	'Dawns Delight' X *R. fortunei*	Cl	Larson
Mrs. Carter Glass	*R. decorum* X 'Catalgla'	Cl	Gable
Mrs. Donald Graham P.A.	('Corona' X *R. griersonianum*) X 'Loderi' G.	Cl	Ostbo, Seed from England
Mrs. Elizabeth Titcomb	'Marinus Koster' X 'Snow Queen' G.	Cl	Larson
Mrs. Helen Weyerhauser	'Fuselier' G. X 'Jean' G.	Cl	Larson
Mrs. Horace Fogg	*R. griersonianum* X (Loderi G.) 'Venus'	Cl	Larson
Mrs. Paul B. Smith	'Albatross' G., X 'Pygmalion'	Cl	Larson
Mt. Mitchell	*R. maximum* X R. catawbiense ?	Cl	Gable
Mucram	*R. mucronulatum* X *R. ambiguum*	Cl	Gable
Nectarine	('Coronis' G. X *R. griersonianum*) X 'Margaret Dunn' G.	G	Brandt
Newport	Catawbiense Hybrid	Cl	Stokes
Old Copper	'Vulcan' G. X 'Fabia' G.	Cl	Van Veen
Ole Olson	*R. campylocarpum elatum* X *R. discolor*	Cl	Lem, plant from Gable
Olympic Blondie	'Fabia' G. X ?	Cl	Clark
Olympic Brave	'Fabia' G. X ?	Cl	Clark
Olympic Brownie	'Fabia' G. X ?	Cl	Clark
Olympic Chimes	'Fabia' G. X ?	Cl	Clark
Olympic Chinook	'Fabia' G. X ?	Cl	Clark
Olympic Hose in Hose	'Fabia' G. X ?	Cl	Clark
Olympic Hunter	'Fabia' G. X ?	Cl	Clark
Olympic Knight	'Fabia' G. X ?	Cl	Clark
Olympic Lady	(Loderi G.)'King George' X *R. williamsianum*	G	Clark, cross by Ostbo
(Olympic Lady G.) White Olympic Lady	(Loderi G.)'King George' X *R. williamsianum*	Cl	Clark
Olympic Maid	'Fabia' G. X ?	Cl	Clark
Olympic Miss	'Fabia' G. X ?	Cl	Clark
Olympic Quinault	Griersonianum Hybrid	Cl	Clark, plant from Layritz

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Olympic Sweetheart	'Romani Chai' G. X *R. discolor*	Cl	Clark
Ophir	see (Dream Girl G.) 'Ophir'		
Oregon Queen (Azdn)	*R. occidentale* X *R. macrophyllum* ?	Cl	Committee
Osceola	Catawbiense Hybrid	Cl	Parsons
Othello	'Carmen' G. X (*R. griersonianum* X 'Armistice Day')	G	Brandt
Painted Star	'*Meadowbrook*' X 'Anita' G.	Cl	Hardgrove
Parson's Gloriosum	Catawbiense Hybrid	Cl	Parsons
Parson's Grandiflorum	Catawbiense Hybrid	Cl	Parsons
Peachblow	?	Cl	Wright, plant from Barto
Pera	*R. pemakoense* X *R. racemosum*	G	Lem
Peter Koster	Fortunei Hybrid	Cl	Dexter ?
Pink Cameo	'Boule de Neige' X red seedling	Cl	Shammarello
Pink Mermaid P.A.	'Azor' G. selfed	Cl	Esch
Pinnacle	Pink catawbiense seedling X pink catawbiense seedling	Cl	Shammarello
Pocahontas	Catawbiense Hybrid	Cl	Parsons
Pow Wow	'Earl of Athlone' X 'Fabia' G.	Cl	R. Henny
President Lincoln	Catawbiense Hybrid (syn. Herbert Parsons, Bertha P., Betsy P.)	Cl	Parsons
Prize	'Boule de Neige' X red Catawbiense seedling	Cl	Shammarello
Puck	*R. racemosum* X *R. spiciferum*	Cl	Wright
Puget Sound	(Loderi G.) 'King George' X 'Van Nes Sensation'	Cl	Clark
Purple Gem	*R. fastigiatum* X *R. carolinianum*	Cl	Hardgrove
Purpureum crispum	Catawbiense Hybrid	Cl	Parsons
Quinella	'Britannia' X 'May Day' G.	Cl	R. Henny

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Ramapo	*R. fastigiatum* X *R. carolinianum*	Cl	Nearing
Red Cloud P.A.	'Tally Ho' G. X 'Corona'	Cl	R. Henny
Red Snapper	'Azor' G. X *R. griersonianum*	Cl	R. Henny
Red Tape	'Earl of Athlone' X 'Fabia' G.	Cl	R. Henny
Renhaven P.A.	'Umpqua Chief' X *R. elliottii*	Cl	James
Renaissance	'Peter Koster' X (Loderi G.) 'King George'	Cl	Fogg
Rocket	'Cunningham's White' X red Catawbiense seedling	Cl	Shammarello
Rom	'Moser's Maroon' X *R. griersonianum*	Cl	Lancaster
Roseann	(Loderi G.) 'Venus' X 'Britannia'	Cl	R. Henny
Rose Elf P.A.	*R. racemosum* X *R. pemakoense*	Cl	Lancaster
Ruby	red Catawbiense seedling X red Catawbiense seedling	Cl	Shammarello
Ruby F. Bowman P.A.	*R. fortunei* X 'Lady Bligh'	Cl	Druecker, seed from Bowman
Satin	'Boule de Neige' X red Catawbiense seedling	Cl	Shammarello
S. B. Parsons	Catawbiense Hybrid	Cl	Parsons
Seattle Gold	'Diva' G. X 'Lady Bessborough' G.	Cl	McClure, plant from Lem
Seattle Springtime	*R. leucaspis* X *R. mucronulatum*	G	Mulligan
Senator Charles Sumner	Catawbiense Hybrid	Cl	Parsons
Sharon P.A.	*R. Soulei* X (Loderi G.) 'King George'	Cl	James
Signal	'Moser's Maroon' X 'Tally Ho' G.	Cl	Lancaster
Sir James	Fortunei Hybrid	Cl	Gable
Skokomish	*R. fortunei* X 'Dr. Dresselhuys'	Cl	Clark, plant from Parker
Snow Lady P.A.	? *R. leucaspis* X *R. ciliatum*	Cl	Lancaster, plant from Tucker

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Solitude	'Britannia' X 'Fusilier' G.	Cl	R. Henny
Spring Glory	'Cunningham's White' X red Catawbiense seedling	Cl	Shammarello
Spring Song	(*R. racemosum* X *R. keiskei*) X *R. keiskei*	Cl	Hardgrove
Starlight	*R. carolinianum* X *R. leucaspis*	Cl	Hardgrove
Stoplight P.A.	*R. griersonianum* X 'Cornubia' G.	Cl	R. Henny
Sunset	'Earl of Athlone' X 'Fabia' G.	Cl	R. Henny
Talisman	see (Margaret Dunn G.) 'Talisman'		
Tan	Fortunei Hybrid ?	Cl	Dexter ?
Tatoosh	'Britannia' X (Loderi G.) 'Venus'	Cl	R. Henny
Tecumseh	Catawbiense Hybrid	Cl	Parsons
Thalia	*R. ciliatum* X *R. ciliicalyx*	G	Brandt
The Cardinal	?	Cl	Gable
The General	red Catawbiense seedling X red Catawbiense seedling	Cl	Shammarello
Three Star	?	Cl	Gable
Thunderhead	?	Cl	Clark
Tolo	'Sarita Loder' G. X (*R. lacteum* X 'Mary Swathling')	Cl	James
Tony	'Boule de Neige' X red Catawbiense seedling	Cl	Shammarello
Towhee	'C. P. Raffill' G. X ('Red cap' G. X 'Tally Ho' G.)	Cl	James
Tranquillity	'Vulcan' G. X 'Corona'	Cl	Wright
Tumalo P.A.	*R. decorum* X (Loderi G. 'King George'	Cl	James
Twinkles	*R. racemosum* X *R. spiciferum*	Cl	Wright
Umpqua Chief	'Fabia' G. X 'Azor' G.	Cl	James
Velma Rozetta	(*R. griersonianum* X 'Pink Beauty') X 'Azor' G.	Cl	Whitney

VARIETIES OF RHODODENDRONS NAMED IN AMERICA

Name	Parentage	Clone Or Group	Named by
Virgin	A Fargesi Hybrid X *R. catawbiense album*	Cl	Abbott
Virginia Scott	*R. soulei* X ?	Cl	Larson
Voodoo	'Britannia' X 'May Day' G.	Cl	R. Henny
Vulcan's Flame	*R. griersonianum* X 'Mars'	Cl	Lancaster
White Olympic Lady	see (Olympic Lady G.) 'White Olympic Lady'		
William Montgomery	*R. atrosanguineum* X *R. griersonianum*	Cl	Gable
Windbeam	'Conestoga' G. open pol.	Cl	Nearing
Wyanokie	'Conestoga' G. open pol.	Cl	Nearing
Yellow Jacket	*R. croceum* X 'Fabia' G.	Cl	R. Henny

A. R. S. CODE OF NOMENCLATURE

FOREWORD

The accurate naming of cultivars (horticultural varieties) is of great importance to everyone interested in plants. Without names which can be depended upon, movement of plants in the nursery trade would be uncertain and likely to cause misunderstandings and gardeners might have great difficulty in obtaining specific desired clones.

In this country the practice, so far as woody plants is concerned, has been to give horticultural variety names to clones so that all plants of a horticultural variety of rose, apple, lilac, etc., are actually part of the one original plant, having been reproduced from it by means of cuttings, layers, or grafts. Such asexually propagated plants, barring the infrequent occurrence of bud sports, are identical.

However, it has been the custom for many English breeders and a few American breeders to give a group designation to all Rhododendron plants derived from a cross between two species or between a species and a cultivar listed in the Stud Book (British). These collective designations, because they have been commonly used without an accompanying word or symbol to show their collective nature, have been indistinguishable from clone names and hence have led to much confusion and no little dissatisfaction on the part of buyers of Rhododendrons who thought they were buying a specified clone and found they were buying a seedling.

An International Code of Nomenclature for cultivated plants was adopted by the Thirteenth International Horticultural Congress meeting in London in 1952. This Code, the culmination of many years of study, was designed primarily to apply to technical publications and is too long and complicated to interest the average amateur gardener. The foreword to the International Code suggests that "Specialist Societies should use it as a basis for their own codes of nomenclature."

The new International Code does permit collective designations but suggests that they be used only with some word such as "hybrids"

Photo J. Harold Clarke

'Show Time', 1955, in Rhododendron Test Garden, Portland, Ore.

or "crosses" to clearly indicate the collective nature of the phrase. Hence one should write R. (Fabia-hybrids or Fabia Crosses) 'Tangerine' or R. (dichroanthum x griersonianum) 'Tangerine' and not R. Fabia var. 'Tangerine'. Furthermore when for a cross between two species the describer has decided to publish a collective name, it is particularly important that, either before or at the same time, he should give a cultivar-name to each particular form of the hybrid that he considers worth distinguishing even if there exists only one such form. If this is not done there is danger that horticulturally inferior forms of the same parentage will be placed under the same collective name at a later date without any cultivar-name being available to distinguish the earliest named and possibly superior "form." This recommendation has not been followed in many cases as a large number of Rhododendron "varieties" have been sold under "group" names only, and in some cases several to many "forms" were marketed under the one name.

The New International Code states that such collective designations

shall include all subsequent generations from the first cross, crosses within those generations and back crosses with either parent.

Recognizing the desirability of clearing up some of these problems, the American Rhododendron Society published a preliminary code in the Bulletin for July 1949. This was adopted by the Directors August 19, 1949 and was reprinted in condensed form in the Bulletin for April, 1951. A proposed revision was published in the Bulletin for April, 1954 and the Code as printed herewith was adopted by the Directors December 17, 1954.

This code is in general agreement with the International Code, differing mainly in being much simpler, shorter, and in disapproving the use of certain procedures which are permissive in the International Code. The most important of these disapproved procedures is the use of group designations for new crosses. Rhododendron species which may be inter-crossed are so varied that, in many cases, the progeny would be so diverse, especially if several generations are raised, that a single name to designate the entire group would be of little value. In any event the collective name means very little unless one knows the formula for which it stands, hence would seem to be superfluous.

The new International Code stresses that the term "cultivar" should be used in preference to "variety," retaining the latter for use in connection with botanical varieties. Since the term cultivar, as defined in the Code, may be used to designate the widely variable "group varieties," as well as clones, it is suggested that Rhododendron fanciers adopt the practice of calling their horticultural varieties "clones" if they are such—rather than "cultivars." The word clone is more accurately descriptive than cultivar, is understood by most American gardeners, and should come into more general use, especially for Rhododendrons.

The International Code recommends that the two components of a formula be placed in alphabetical order with the female parent, if known, being indicated by the sign ♀ and the male by ♂. It has been the custom in horticultural writings in this country to place the female parent first and the International Code permits such usage provided it is so indicated. It would seem wise to follow American precedent in this case and so such usage is recommended in the following code.

THE AMERICAN RHODODENDRON SOCIETY CODE OF NOMENCLATURE FOR HORTICULTURAL FORMS

Accurate names are important to all concerned with Rhododendrons, the amateur grower, the breeder and the nurseryman. The provisions of this Code, if followed, should help to eliminate confusion and error and certain abuses which have occurred in the past. Such abuses have included renaming or the giving of new names to old clones, the giving of old names to new clones, the selling of seedlings as named clones under the name of the mother parent, etc.

1. Seedlings not quite good enough to be named, if distributed at all, should be sold simply as "seedlings," preferably for mass planting. The inferior plants should be destroyed.

2. New Rhododendron cultivars (horticultural varieties) should be introduced only as clones. The naming of collective groups, to include all the offspring of a particular cross seems superfluous, is contrary to general American horticultural practice, at least in the field of woody plants, and should not be done. There is no objection to the use of names indicating certain groups of cultivars, as Ghent Azaleas.

3. If it is desired to indicate parentage in published descriptions the formula should be used, with the female parent written first, so it would be R. (dichroanthum X griersonianum) 'Tangerine'. Where a group is already well known, it might be stated that 'Tangerine' is a clone selected from the 'Fabia' group or is one of the 'Fabia' hybrids but it should not be written Fabia var. 'Tangerine'. (Fabia G.) 'Tangerine' is acceptable.

4. There is no objection to the naming of an outstanding plant of a species or a seedling of unknown parentage provided it is to be propagated asexually as a clone.

5. A new clone should be adequately described, both as to plant and flower character, in some accepted publication (as the ARS Bulletin) using the RHS color charts in the preparation of the color description. The parentage should be given for the benefit of other breeders. Publication in a catalog is acceptable if there is a description and the catalog is dated.

6. No name which has been previously used either as a group or

clonal name should be used again. No name which has been used for an Azalea should be used for a Rhododendron and vice versa, as this would be contrary to the International Code.

7. The correct name for a clone is the earliest legitimate name; clones should not be renamed.

8. It is suggested that names should be simple and descriptive or meaningful. They should preferably be of one word although two are permissable. Under no circumstances should cultivars be given Latin names. Old cultivar names in Latin may be retained but should be printed in Roman type with 'single quotation marks' whereas the botanical names in Latin are ordinarily printed in italics. Words formed by combining parts of the Latin names of the parent species are not approved as Latin descriptions would be required, according to the International Code.

9. Names which should be avoided include those with single letters, the articles, A and The, and titles such as Mr., Mrs., Dr., Capt., etc. Certainly if there is a 'Mr. Brown' Rhododendron then one should not be named 'Mrs. Brown.' Names of States or Countries, without another word should not be used. Names likely to be confused as 'Caroline' and 'Carolina,' and those which exaggerate, as 'Best of All' should be avoided.

10. A cultivar should not be named after a living person without his consent.

11. Breeders are asked to present proposed names and descriptions to the American Rhododendron Society to be added to its check list. If the name were one which had been used previously the breeder would be requested to choose another name. The American Rhododendron Society does not name new cultivars for breeders, nor can it prevent breeders from using any names they may wish. It may suggest that certain proposed names do not conform to the Code.

12. Catalogs and articles listing foreign cultivars should ordinarily use the foreign names "as is" and not in translated form. However, where a foreign name would cause some difficulty it may be permissible to change the name, in which case the new name becomes a commercial synonym and when published should be followed by an indication of the original name.

13. In view of the fact that there are already many "group

varieties" in commerce they must be indicated in some way. It is suggested that in retail catalogs which list any of these groups they should be marked "G." and it is requested that the following statement be printed in the catalog:

RHODODENDRON NOMENCLATURE

Two types of horticultural varieties of Rhododendrons are in the nursery trade. The first type includes those cultivars (horticultural varieties) which have been propagated asexually by cuttings, layers, or grafts from one original selected seedling. Such cultivars are called clones and all plants of such a cultivar have identical characters except as they are influenced by environment. The second type of horticultural variety consists of a group of seedlings of a particular cross, usually between two species, or between a species and a cultivar. Such "group varieties" exhibit more or less variation, so that two plants of such a "variety" may be quite different. As recommended in the American Rhododendron Society Code of Nomenclature, we are marking all "group varieties" by the abbreviation "G." All cultivars not so marked are clones. All special award cultivars, marked P.A., A.E., T.G.C., A.M., F.C.C., etc. are clones which have been propagated asexually from the original plant receiving the award.

A. R. S. AWARD PLANTS

DESCRIPTIONS SUMMARIZED FROM THE A.R.S. BULLETIN

'King of Shrubs' P. A. (1950—A free growing plant with oblong-lanceolate to elliptic-lanceolate leaves about 6 ins. long, 2 ins. wide. glabrous at maturity, dull, dark green. Flowers 9 to 10 on short rachis, widely campanulate, 4 ins. wide, of firm substance, apricot-yellow at base, with greenish yellow spotting in throat at base of upper petals, inner margin broadly banded Porcelain Rose (620/2), outside flushed Carmine Rose (6/211). Petals 5 to 7, margin undulate. apex notched. Raised by Endre Ostbo, Bellevue, Wash., parentage not known, seed from England.

'Stoplight' P. A. (1951)—Leaves oblong-elliptic, 6½ ins. long. 1¾ in. wide. Flowers 11 to 13 funnel campanulate, 3½ ins. wide. Geranium Lake (20/1). Petals 5, slightly notched. *R. griersonianum* X 'Cornubia' G., raised by Rudolph Henny, Brooks, Ore.

'Ruby F. Bowman' P. A. (1951)—Leaves oblong-elliptic, 4 to 7 ins. long, petioles red. Flowers 13 to 15, 4½ ins. wide, Tyrian Rose (24/1), throat Ox Blood Red to Ruby Red (823/27). Petals 6 to 7. undulate and recurving. *R. fortunei* X 'Lady Bligh', raised by John S. Druecker, Fort Bragg, Cal., seed from Mrs. Ruby F. Bowman.

'Grace' P. A. (1952)—Leaves oblong to oblong-elliptic, 5 to 6½ ins. long, apex obtuse. Flowers 13 to 15 on 3 in. rachis, pedicels 2½ ins., funnel campanulate, 4½ ins. wide, Rhodamine Pink (527/1). Petals 5 to 6, slightly recurved. 'Loderi' G. X 'Borde Hill'. raised by Rudolph Henny, Brooks, Ore.

Voodoo' P. A. (1952)—Leaves 4½ ins. long, recurved at the margin, loose tan indumentum underneath. Flowers 10 to 12, short rachis, funnel campanulate, 2½ ins. wide, Rose Red (724), shaded to Cardinal Red (822) in the throat. Petals, 5 slightly notched, calyx lobes 1½ ins. long, ¼ in. wide, recurved. 'Britannia' X 'May Day' G., raised by Rudolph Henny, Brooks, Ore.

'CIS' P. A. (1952)—Leaves oblong-elliptic, dull green, thin farina underneath. Flowers 9 to 11 on a 2 in. rachis, funnel shaped, 4 ins. wide, Geranium Lake (20/2), shaded to deep cream (503/2). Petals 5 to 6, notched, calyx petaloid, irregular lobed, 1½ ins. long. 'Loder's White' X 'Fabia' G., raised by Rudolph Henny, Brooks. Ore.

Photo John Bacher

R. leucaspis, a fine, low growing, early flowering species.

'James Barto' P. A. (1953)—Leaves elliptic (about 3 ins. long by 1¾-2 ins. wide, glabrous. Flowers 3 to 5, loosely arranged, funnelform, 2½ ins. wide, Fuchsine Pink (627/3). Petals 6, rounded, undulate, crenate. Possibly *R. williamsianum* X *R. orbiculare,* shown by Clarence Prentice, Seattle, plant from James Barto.

'Little Pudding' P. A. (1953)—Leaves oblanceolate to elliptic, 3½ ins. long, thin indumentum underneath. Flowers 10 to 13, truss rather loose, funnel campanulate, 4 ins. wide, Camellia Rose (622/1) to Chinese Coral (614/2) in the throat. Petals 5 to 7, calyx irregular, to 2 ins. *R. decorum* X 'Fabia' G., raised by Rudolph Henny, Brooks, Ore.

'Red Cloud' P. A. (1953)—Leaves oblong elliptic, 5 to 6 ins. long, underside very pale green. Flowers 16 to 18 in a tight truss, 3 in. rachis, funnel campanulate, 3½ ins. wide, Claret Rose (021), inner part of tube overlaid Scarlet (19/1). Petals 5. 'Corona' X 'Tally Ho' G., raised by Rudolph Henny, Brooks, Ore.

Photo J. Harold Clarke

'Snow Lady' P.A. probably a seedling of *R. leucaspis* X *R. ciliatum*, growing in the garden of Robert Bovee, Portland, Ore.

'Rose Elf' P. A. (1954)—Plant dwarf, spreading. Leaves broadly elliptic ¾-1¼ in. long by ½-¾ in. wide, shiny dark green. Flowers open bell shape, 1¼ in. wide, Imperial purple (33/2) to (33/3). *R. racemosum* X *R. pemakoense*, raised by Ben F. Lancaster, Camas, Wash.

'Little Sheba' P. A. (1954)—Leaves 2¼ ins. long by 1 in. wide. Flowers 3, upright in a terminal umbel, campanulate, 2¼ ins. wide, Blood Red (820/1). Calyx ¾ in. long, recurved. ('Earl of Athlone' X 'Fabia' G.) X *R. forrestii* var *repens*, raised by Rudolph Henny, Brooks, Ore.

'Anna Rose Whitney' P. A. (1954)—Leaves 7 to 9 ins. long, 3 ins. wide. Flowers 18 to 21 in a tight truss, rachis 3½ ins., corolla 4½ ins. wide, Rose Bengal (25/2). Petals 5. *R. griersonianum* X 'Countess of Derby' G., raised by W. E. Whitney, Camas, Wash.

'Pink Mermaid' P. A. (1954)—Leaves lanceolate, 6 ins. long, 1¾ ins. wide. Flowers 9, on 1 in. rachis, funnel shaped, 4½ ins. wide,

Dawn Pink (523/3), edged with China Rose (024/2), deeper (024/1) in tube. Petals 5 to 6, slightly notched. 'Azor' G. selfed, raised by B. J. Esch, Portland, Ore.

'Merle Lee' P. A. (1954)—Habit, spreading, leaves lanceolate, 6 ins. long, 1¾ ins. wide. Flowers 8 to 10 on 1 in. rachis, funnel shaped, slightly ribbed, 4 ins. wide, Rhodamine Pink (527/3). Petals 5 to 6. 'Azor' G., selfed, raised by B. J. Esch, Portland, Ore.

'Mrs. Donald Graham' P. A. (1954)—Leaves lanceolate, to 7 ins. long by 2 ins. wide. Flowers 8 to 10, widely expanded, 5 ins. wide, Tyrian Rose (24/2) to (24/3), with a Spinel Red (0023/1) line down the back of the petals. Petals rounded, notched at apex, undulate. ('Corona' X *R. griersonianum)* X 'Loderi' G., raised by Endre Ostbo, Bellevue, Wash. from English seed.

(Dream Girl G.) 'Gold Mohur' P. A. (1955)—Plant 3 ft. tall, compact. Leaves elliptic-lanceolate, 5 to 6 ins. long, 2 ins. wide, glabrous. Flowers 10 to 12 in loose truss, funnel shaped, 3 ins. wide. Barium Yellow (503) within the tube, spotted greenish on the upper part, becoming (503/1) to (503/2) towards the margin. 'Day Dream' G. X 'Margaret Dunn' G., raised by Lester Brandt, Tacoma, Wash.

'Snow Lady' P. A. (1955)—Low, spreading shrub. Leaves elliptic, 1½-3 ins. long by ¾-1½ ins. wide, setose. Flowers 4 to 8, 2½ ins. wide, pure white. Probably *R. leucaspis* X *R. ciliatum*, shown by Ben F. Lancaster, Camas, Wash. Cuttings came from plant in W. G. Tucker collection who obtained it from Lionel de Rothschild, labeled *R. leucaspis.*

'Geneva' P. A. (1955)—Flowers campanulate, frilled, recurved, 3 ins. wide, edged Camellia Rose (622), shading through (622/1), (622/2), and (622/3) towards center, inconspicuously spotted on upper lobe Majolica Yellow (09/1). 'Unknown Warrior' X 'Fabia' G., raised by John Bacher, Portland, Ore.

'Bern' P. A. (1955)—Flowers 7-lobed, 4 lower lobes protruding, 3 upper recurving, 4¾ ins. wide, Pastel Mauve (433), lighter towards center, prominent blotch Magenta Rose (027). *R. decorum* X garden hybrid, raised by John Bacher, Portland, Ore.

'Bacher's Gold' P. A. (1955)—Flowers 6-lobed, broad funnel-shaped, 4 ins. wide, margins Venetian Pink (420/2) shading to

Saffron Yellow (7/3) at center, Burnt Orange (014) spots, shading to Deep Crimson (21) on top lobes. Calyx prominent, irregularly lobed, to 1½ in. long. 'Unknown Warrior' X 'Fabia' G., raised by John Bacher, Portland, Ore.

'Moontide' P. A. (1955)—Leaves elliptic to oblong-elliptic, 5 ins. long, 2 ins. wide. Flowers 14 to 16 in an upright truss, funnel-shaped, 3½ ins. wide, White. Petals 5 to 6. *R. wardii* X 'Loder's White', raised by Rudolph Henny, Brooks, Ore.

'Lake Labish' P. A. (1955)—Leaves elliptic, 6 ins. long, 2½ ins. wide. Flowers 17 in an upright truss, campanulate to slightly funnel-shaped, 3½ ins. wide, Neyron Rose (623). Petals 5. 'Lady Bligh' X (Loderi G.) 'Venus', raised by Rudolph Henny, Brooks, Ore.

'Fawn' P. A. (1955)—Plant tall, leaves 6 to 8 ins. long, 2 ins. wide. Flowers rather flat and recurving, 5 ins. wide, Salmon shading to Yellow towards center. Petals 8. *R. fortunei* X 'Fabia' G., raised by D. W. James, Eugene, Ore.

'Renhaven' P. A. (1955)—Plant low, compact. Leaves lanceolate, 4 to 6 ins. long. Flowers 6 to 8 in truss, funnel-shaped, 4 ins. wide, Geranium Lake. 'Umpqua Chief' X *R. elliottii*, raised by D. W. James, Eugene, Ore.

'Sharon' P. A. (1955)—Plant medium tall, leaves to 6 ins. long and 4 ins. wide. Flowers saucer-like, 5 ins. wide, White with Crimson blotch. *R. souliei* X (Loderi G.) 'King George', raised by D. W. James, Eugene, Ore.

'Tumalo' P. A. (1955)—Medium sized, compact plant with large leaves. Flowers, 10 to a truss, 5 ins. wide, White, ruffled. *R. decorum* X (Loderi G.) 'King George', raised by D. W. James. Eugene, Ore.

'Full Moon' P. A. (1955)—A yellow flowered seedling of 'Hawk' G. X 'Adriaan Koster', raised by John Henny, Brooks, Ore.

PRELIMINARY AWARDS GRANTED SUBJECT TO NAMING

A selection of ('Britannia' X *R. griersonianum)* X 'Loderi' G., raised by Marshall Lyons, Eugene, Ore. (1951)

A selection of 'Britannia' X *R. griersonianum,* raised by George Grace, Portland, Ore., seed from England. (1951)

A selection of his 'Anna' G. cross, 'Norman Gill' G. X 'The Hon. Jean Marie de Montagu', raised by Halfdan Lem, Seattle, Wash. (1952)

Seedling No. 49, 'Mrs. J. H. van Nes' X 'Loderi' G., raised by Halfdan Lem. Seattle. Wash. (1952)

A selection of his 'Lem's Goal' G. cross, 'Lady Bessborough' G. X 'Azor' G., raised by Halfdan Lem, Seattle, Wash. (1952)

A selection, known temporarily as Lily No. 1, ('Alice' X *R. auriculatum)* X 'Mrs. Donald Graham', raised by Endre Ostbo, Bellevue, Wash. (1952)

An Azaleodendron selection, known temporarily as Pink No. 5, *R. occidentale* X 'Mrs. Donald Graham', raised by Endre Ostbo. Bellevue, Wash. (1952)

A seedling known temporarily as No. 5, 'Earl of Athlone' X 'Rubina' G., shown by Endre Ostbo, Bellevue, Wash., plant from Lester Brandt. (1953)

A selection known temporarily as Elliottii No. 4, *R. elliottii* X 'Fabia' G. (?), shown by Clarence Prentice, Seattle, Wash., seed from Herb Ihrig. (1953)

A selection known temporarily as James Purple Form, *R. pseudoyanthinum,* raised by D. W. James, Eugene, Ore. (1954)

A selection known temporarily as Pink Davidsonianum, *R. davidsonianum,* raised by Marshall Lyons, Eugene, Ore. (1954)

An unnamed selection, 'Earl of Athlone' X 'F. C. Puddle' G., raised by Robert Walker, Portland, Ore. (1954)

A selection of 'Souldis' G., *R. souliei* X *R. discolor,* raised by Endre Ostbo, Bellevue, Wash. (1954)

A selection of 'Britannia' X (Loderi G.) 'Pink Diamond', shown by Mrs. Ella Torpen. Beaverton, Ore., seedling from Roy Hennessey. (1955)

THE A. R. S. SYSTEM OF AWARDS

HISTORY

For close to 100 years the Royal Horticultural Society of England has recognized superior species or horticultural varieties of Rhododendrons by giving them Awards of Merit or First Class Certificates. These awards have been of some value to American Rhododendron growers but growing conditions here are so different that it is not surprising that some "award plants" have proved to be rather mediocre. In view of the great interest in breeding it seemed very desirable that some sort of an award system be set up in this country. Furthermore, it was felt that the results might be better interpreted in terms of values for American gardens.

Considerable study was given to the matter and an award system set up by motion of the Directors on August 19, 1949. It was felt desirable to have the American System in general accord with that of the R.H.S. but distinct enough so there would be no chance of confusing the two. The purpose of the awards is twofold. First, an award gives recognition to an outstanding variety and through the plant to the breeder who produced it. In the second place, awards should give some indication to gardeners as to the quality and desirability of the new varieties so recognized.

The following system of awards, which contains certain modifications of that previously used, was adopted by the Directors on December 17, 1954.

THE AWARD SYSTEM

The first award shall be entitled "Preliminary Award" (P.A.). It shall be given on the basis of a cut truss, with foliage, exhibited at a Show, or meeting, or other occasion where at least three officially appointed judges, can be assembled. This award is designed to give an early indication of the value of a variety and to encourage the breeder to present the plant later for further awards.

The second award, called "Award of Excellence" (A.E.), is based on a complete plant, with foliage and plant characters as well as flower characters to be considered, by at least three official judges.

The third award, "Test Garden Certificate" (T.G.C.) shall be

Photo Rudolph Henny

R. calostrotum grown by Rudolph Henny.

given to worthy plants which have been propagated vegetatively and are growing in a recognized A.R.S. test garden. The variety must have been observed in bloom in the test garden by at least three official judges for at least two years before the T.G.C. is awarded. As an alternative the variety may be grown and judged by three judges for at least two years in at least three private gardens of which one may be the originator's. These gardens must be at least a mile apart. This should take care of situations where a breeder does not want to trust what he considers to be a valuable new variety to a Test Garden where the public may have more or less free access. In certain areas there are no Test Gardens nearby and breeders might feel that a particular seedling, while being extremely valuable in their own locality, might not show up so well in a Test Garden at a great distance. The requirement that the gardens be at least a mile apart insures some variability of growing conditions and, to a certain extent, offsets the lack of more or less standardized and unbiased cultural attention which would be accorded in a Test Garden.

The judges for A.R.S. awards should be appointed annually by

the President of the American Rhododendron Society. Suggestions from Chapters as to competent judges are invited.

Official judges will usually be on hand at the larger shows but judging in private gardens or at smaller shows and meetings must be by request, as far in advance as possible, to the American Rhododendron Society, or to a regional chairman of judges. There is no guarantee that the judges will be able to see any particular plant at a given time because of travel problems. However, an effort will be made to take care of requests. It is suggested that breeders who cannot be reached by official judges should propagate their outstanding plants and send them to one of the Test Gardens where they may be judged.

The origin of the plant must be certified by the person requesting judging or scoring.

Awards may be made by a majority vote of the judges, provided at least three official judges score the entry. If an official judge has an entry of his own, he shall not be present when it is scored.

Judging should be on a score card basis for A.E. or T.G.C. A plant scoring 90% or over may be given an award and a XXXX rating, as XXXX Stardust T.G.C. A plant scoring 80% and less than 90% may be given a XXX rating and one scoring 70% or over and less than 80% may be given a XX rating. Varieties scoring less than 70% should not be given awards. However a high score does not necessarily mean a plant should have an award. The Society reserves the right to revise the A.R.S. quality ratings given to award plants. Judges should consider distinctiveness of a variety in making awards. No award should be given except to clones which are reasonably distinct from other existing previously named varieties, so that there would be some real reason for their propagation and introduction. If a number of seedlings with quite similar characteristics are entered the award should be made only to the most outstanding one.

The Judges should turn in, with their decision granting an award, a description for publication, not to exceed 100 words, and preferably on a regular check list card. This description should include variety name, name of person requesting the scoring, name of the breeder, parentage of variety, place where scored, flower character, including season of bloom, colors (to be designated by Royal Horticultural Society color chart standards) leaf characters, type and probable size of plant. Awards to unnamed clones are made "subject to naming."

Photo Rudolph Henny

R. scintillans F.C.C. in Rudolph Henny's garden, Brooks, Ore.

Official Test Gardens are presently located at the Arboretum of the University of Washington, Seattle, Washington, the Rhododendron Island, Crystal Springs Lake, Portland, Oregon, and the Morris Arboretum, Philadelphia, Pennsylvania. Varieties to be entered in Test Gardens must be accepted by the A.R.S. and the Test Garden management because of limitations of space. It is suggested that one to three plants of a variety, depending on anticipated size, three for dwarf varieties, be provided when making a Test Garden entry.

Plants entered for awards at a Test Garden shall become the property of the Garden but stock may not be disposed of without permission of the person making the entry.

The Judges should recommend that inferior varieties be eliminated from test gardens after adequate observation, and after the person submitting the plants for test has been notified.

There is no objection to the entering of recent foreign varieties in the Test Gardens if the originators wish to send them and they are otherwise acceptable.

THE A.R.S. SCORE CARD

Plants Characters (50%)	
Habit	—20
Foliage	—30
Flower Characters (50%)	
Floriferousness	—10
Color	—20
Texture and substance	—10
Truss	—10
	Total 100

EXPLANATION OF SCORE CARD:

The score card is to be used only as a guide in evaluating a variety, as it is possible that a variety might be almost perfect in all but one character and hence score quite highly, but, be almost worthless because of its one fault.

Habit:

Type of branching, compactness, beauty and general desirability of growth habit, resistance to breakage.

Foliage:

Leaf coverage, too skimpy, too dense, starting early enough to obscure the flowers, droopy or attractively held, persistance, color, size, texture, winter appearance, resistance to pests, resistance to frost or sun scald.

Floriferousness:

Age at which plant flowers, abundance of flowers, regularity of flowering, flowers too crowded.

Color:

General desirability, novelty, tendency to fade.

Texture and Substance:

Resistance to bruising and breakage, lasting quality.

Truss:

Number and size of flowers, proportion, compactness, visibility as affected by new growth.

A. R. S. VARIETY AND SPECIES RATINGS

Merit ratings of one kind or another have been used by many organizations and individuals to indicate roughly the relative horticultural value of a variety or a species. The Royal Horticultural Society for many years has used a rating system for Rhododendrons based on four asterisks **** for the best varieties or species with none for the poorest. The American Rhododendron Society rating system follows the British system with xxxx for the best variety or species, but with o for the poorest to distinguish such plants from those which have not yet been rated. The first A.R.S. ratings for varieties were published in the Bulletin for Oct., 1950, and for species in the Bulletin for Jan., 1951.

In preparation for the present ratings questionnaires were sent to all A.R.S. members and replies were received from more than 70 persons, most of whom had a fairly large Rhododendron collection and were able to rate a number of species or varieties. The replies were summarized and the committee went over the summary to decide the rating where the questionnaire replies did not clearly indicate which rating should be used. If very few replies were received for a particular variety, and the committee members were not familiar with it, no rating was established. Obviously quality ratings are based on personal opinions and the more opinions considered the more accurate the rating. Obviously also all such ratings must be considered as tentative and subject to revision as more information becomes available.

The rating of group varieties obviously poses a problem as sister seedlings would naturally vary in general merit, as well as in hardiness and possibly in size of plant, color, and season of bloom. The quality and hardiness ratings given are to be interpreted as referring to the best selections of the group. The same situation prevails with respect to species and ratings are based on the best plants rather than the average.

All varieties listed are clones unless the name is followed by "G." to indicate that it is a "group variety". The giving of names to group varieties is not approved by the A.R.S. Code of Nomenclature but those now in the nursery trade must, of course, be recognized. Actually many of the varieties marked with a "G." were

probably introduced in only one clonal form but they are potential group varieties as they are listed in the R.H.S. Stud Book and, according to the British system, anyone may make the same cross and use the same name for all the resulting seedlings. An attempt was made to determine which, if any, of the group varieties were introduced, and are still in the trade, as only one clone. Mr. Francis Hanger and Mr. N. K. Gould of the R. H. S. went over the list and marked the following as clones, although they do appear in the Stud Book—'Countess of Derby', 'Countess of Haddington', 'Ernest Gill', and 'Gill's Triumph'. It seems that it might be rather difficult to make up an extensive list of such varieties and so we are marking as groups all varieties which are listed in the Stud Book.

The hardiness ratings were also determined by survey and by weighing the answers of those so located that they would have an unusually good opportunity of observing the limits of tolerance to cold. The hardiness ratings indicate the minimum temperatures which the varieties or species may be expected to withstand with no appreciable injury to leaf, stem, or bud. It is realized, of course, that many seasonal and environmental factors may affect hardiness. The ratings are as follows: *H-1 Hardy to —25°F.* These varieties should be hardy in southern New York and southern New England. *H-2 Hardy to —15°F. H-3 Hardy to —5°F.* These should be fairly hardy in the southern part of Long Island and around Philadelphia. *H-4 Hardy to +5°F. H-5 Hardy to +15° F.* These should be fairly hardy during most winters in the Portland and Seattle areas. *H-6 Hardy to +25°F. H-7 Hardy to +32°F.*

One of the most important facts about a garden plant is its size. Rhododendrons have most frequently been put into two size groups, the dwarfs and all others. In an effort to classify them more accurately A.R.S. members were asked to estimate the height of varieties and species at an age of 10 years. The replies were summarized and given in feet in the column headed Ht. 10 yrs.

Another important plant character is time of blooming. That was secured from the literature and from the experience of the Committee and is given in terms of: VE—very early, February and March; E—early, April; EM—early midseason, late April to mid May; M—midseason, mid May; LM—late midseason, late May; L—late, June; VL—very late, late June, July and August.

Color descriptions were taken primarily from the literature and

especially from the R.H.S. Handbook. The terms are, of course, quite general and will be of more value in proving what a variety is not, than in actually identifying it.

The parentage, so far as possible, is given from the literature with the female parent written first. Authorities did not always agree and so the crosses given should be accepted, not as scientific fact, but as probably accurate for the most part. The terms Catawbiense Hybrid, Thomsonii Hybrid, etc., indicate that the exact parentage is unknown, but that the species mentioned is presumably one of the parents.

The name of the institution or individual naming a particular variety is perhaps of academic interest, but of interest nevertheless and so is given if known to the editor. For the group varieties the name of the originator only indicates who first made the cross and registered the name and not necessarily the person who produced a particular clone. The dates given for the group varieties are the dates of registration. It should be of general interest to know whether a variety is a very old one or a comparatively recent one and so wherever dates for a particular variety appeared in the literature they have been included in the table. Usually it has been difficult to tell whether the date refers to the time the cross was made, first flowering, time of naming, or time of introduction to the trade, but it does help to tag the variety as old or recent.

The sources of information most frequently used in compiling information about varieties were the R.H.S. Handbook, "Rhododendrons en Azaleas" by Grootendorst, "Rhododendrons and the various Hybrids" by Millais, "Hardy Rhododendrons" by Street, and "Rhododendrons and Azaleas" by Bowers. There were a few points of disagreement in spelling but in general the R.H.S. Handbook was followed. Grootendorst lists Dr. A. Blok but Mr. Henk Dekens of Blaauw & Co. spells it Dr. O. Blok in the 1947 A.R.S. Yearbook and so that spelling is used. There has seemed to be some disagreement as to the name 'The Hon. Jean Marie de Montagu'. This is a van Nes hybrid and a recent letter from Mr. Henk Dekens, Pres. of Blaauw & Co., successors to van Nes, states that the correct name is as given above. He states that it is frequently shortened to 'Jane Marie Montagu'. The 'Jane' is probably a typographical error and so 'Jean Marie Montagu' would seem to be the best short form, although 'Montagu' is often used. Grootendorst, writing in Boskoop, uses 'Jean Mary Montague'. Some of the confusion may be due to language difficulties. At any rate such long names

should generally be avoided as there is an inevitable tendency to shorten them in actual use, often resulting in some confusion.

The R.H.S. Handbook uses 'Fastuosum plenum' for the old double mauve long listed as 'Fastuosum flore pleno', another too-long name, and we have followed the R.H.S form.

The following varieties are azaleodendrons, although they are not so marked in the table: 'Broughtonii aureum', 'Galloper Light', 'Glory of Littleworth', and 'Odoratum'.

The following list gives certain information about the breeders, or introducers, whose names appear in the table which follows. In a few cases nothing could be found in the publications available and those names are omitted. The general location is given if available, but no attempt was made to give actual mailing addresses.

ABERCONWAY—Lord Aberconway, Bodnant, Wales, longtime President of the Royal Horticultural Society.
A. M. WILLIAMS—Cornwall, England.
A. WATERER—Anthony Waterer, Jr. and Sr., nurserymen at what is now Knap Hill Nursery, Surrey, England.

BERTIN—Versailles, France, succeeded by Moser.
BLAAUW—J. Blaauw & Co., Boskoop, Holland, successors to C. B. van Nes.
CLARKE—Col. Stephenson Clarke, Borde Hill, Sussex, England.
CROSFIELD—England.
CUNNINGHAM—England.

DEN OUDEN—H. den Ouden and Sons, Boskoop, Holland.

ENDTZ—L. J. Endtz Co., Boskoop, Holland, purchased by Blaauw & Co.

FISHER—Handsworth Nursery, Surrey, England.
FOX—Barclay Fox, Cornwall, England.
FRANCOIS—Francois Bros., Ghent, Belgium.

GABLE—Joseph Gable, Stewartstown, Pa.
G. H. LODER—Sir Giles Loder, Leonardslee, Sussex, England.
GILL—Richard Gill, Cornwall, England.
G. WATERER—son of John Waterer II, at Bagshot and later owner of what is now Knap Hill Nursery, Surrey, England.

HALOPE—Belgium.
HENEAGE-VIVIAN—Admiral Walker-Heneage-Vivian, Swansea, Wales.
HENNY—John Henny, Brooks, Oregon.
HERBERT—The Very Rev. Dean Wm. Herbert, England.
HILLIER—Hillier Nursery, Winchester, England.
H. WATERER—Hosea Waterer I, son of Michael Waterer, uncle of Anthony Waterer Sr., and for many years owner of Knap Hill Nursery.

J. WATERER—John Waterer, I, II, and III, three generations of this name at the Bagshot Nursery of the Waterer family.
J. C. WILLIAMS—Caerhays Castle, Cornwall, England.

KEW—Royal Botanic Gardens, Kew, Surrey, England.
KNAP HILL—The Knap Hill Nursery, formerly the old Waterer Nursery, Surrey, England.
KOSTER—M. Koster & Sons, Boskoop, Holland.

LEE—Lee and Kennedy, London, England.
LODER—Sir Edmund Loder, Leonardslee, Sussex, England.
LOWINSKY—T. H. Lowinsky, Berks., England.

MAGOR—E. J. P. Magor, Cornwall, England.
MANGLES—H. J. Mangles, Haslemere, England.
MASON—J. H. Mason, Liverpool, England.
METHVEN—Thomas Methven & Son, Edinburgh, Scotland.
MOSER—Moser & Sons, Versailles, France.

NORTH—Col. North, England.

OSTBO—Endre Ostbo, Bellevue, Wash.

PARKER—England.
PARSONS—Samuel Parsons, Flushing, L.I., N. Y.
P. D. WILLIAMS—Cornwall, England.

ROLLISON—England.
ROTHSCHILD—Lionel de Rothschild, Exbury, Hampshire, England.

SAUVAGE—Belgium.
SCRASE-WILLIAMS—England.
SEIDEL—T. R. Seidel, Dresden, Germany.

SLOCOCK—W. C. Slocock Nursery, Surrey, England.
SMITH—Wm. Smith, England.
S. SMITH—Penjerrick, Cornwall, England.
STANDISH—previously of Standish and Noble.
STANDISH AND NOBLE—Nursery, now Sunningdale, Surrey, England.
STIRLING-MAXWELL—England.
SWAYTHLING—Lord Swaythling, Southampton, England.

THOMPSON—England.

VAN NES—C. B. van Nes, Boskoop, Holland, now Blaauw & Co.
VAN HOUTTE—Louis van Houtte, Belgium.
VEITCH—R. Veitch, England.

WAT., SONS & CR.—John Waterer, Sons & Crisp, Berks., England.
WHITE—Harry White, Sunningdale Nurseries, Surrey, England.
WILDING—England.

GENERAL LIST OF VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xxx	A. Bedford	H-3	8	M	Lavender, dark eye			
x	Adriaan Koster	H-3	5	M	Creamy white, yellow center	Campylocarpum Hybrid	Koster	
xx	Adrastia G.	H-3	2	EM	Pinkish rose	*R. williamsianum* X *R. neriiflorum*	Aberconway	1941
xx	Aladdin G.	H-3	6	L	Clear pink	*R. griersonianum* X *R. auriculatum*	Crosfield	1935
xxx	Albatross G.	H-3	6	L	White	'Loderi' G. X *R. discolor*	Rothschild	1933
xx	Alice	H-3	6	LM	Deep pink fading to pale rose	Griffithianum Hybrid	G. Waterer	
x	Amy	H-3	5	M	Bright rose	'Mrs. E. C. Stirling' X ?	G. Waterer	
xx	Angelo G.	H-4	6			*R. griffithianum* X *R. discolor*	Rothschild	1933
xxx	Annie E. Endtz	H-3	6	LM	Light pink	'Pink Pearl' X hardy hybrid	Endtz	
xx	Antoon van Welie	H-3	5	LM	Carmine-pink	'Pink Pearl' X hardy hybrid	Endtz	
o	Armistice Day	H-3	4	EM	Blood-red	'Maxwell T. Masters' X No. 28D	Van Nes	
x	(Argosy G.) Snow White	H-3	8	VL	White	*R. discolor* X *R. auriculatum*	A. Waterer	
xxx	Arthur J. Ivens G.	H-2	3	E	Pale pink	*R. williamsianum* X *R. houlstonii*	Hillier	1944
xxx	Arthur Osborn G.	H-3	2	L	Dark scarlet	*R. didymum* X *R. griersonianum*	Kew	1933

x	Ascot Brilliant	H-3	5	E	Deep crimson	Thomsonii Hybrid	Standish	186-
xxx	Augfast G.	H-3	3	E	Blue-violet	*R. augustinii* X *R. fastigiatum*	Magor	
xxx	Avalanche G.	H-3	6	L	White, flushed pink	'Loderi' G. X *R. calophytum*	Rothschild	1933
xx	Azma G.	H-4	6	LM	Pink	*R. griersonianum* X *R. fortunei*	Stevenson	1933
xxx	Azor G.	H-4	6	L	Soft salmon	R. *griersonianum* X *R. discolor*	Stevenson	1933
x	Bagshot Ruby	H-3	5	LM	Blood-crimson	?	G. Waterer	
xx	Barbara G.	H-4	4	M	Creamy yellow	*R. campylocarpum elatum* X 'Loderi' G.	Rothschild	1934
	(Barclayi G.)							
xxx	Helen Fox	H-5	5	E	Intense crimson	*R. thomsonii* X 'Glory of Penjerrick' G.	Fox	
xxxx	Robert Fox	H-5	5	E	Intense crimson	*R. thomsonii* X 'Glory of Penjerrick' G.	Fox	
xx	B. de Bruin	H-3	5	L	Dark red		A. Waterer	
x	Beacon G.	H-4	2	L	Deep orange	'Fabia' G. X 'Arthur Osborn' G.	Aberconway	1942
xx	Beau Brummell G.	H-3	6	M	Scarlet	'Essex Scarlet' X *R. eriogynum*	Rothschild	1934
xxx	Beauty of Littleworth	H-3	8	EM	White	Griffithianum Hybrid	Mangles	
xxx	Betty Wormald	H-3	6	LM	Rose pink, pale purple blotch	'George Hardy' X unknown red	Koster	
xx	Bibiani G.	H-4	6	M	Scarlet	'Moser's Maroon' X *R. arboreum*	Rothschild	1934
xx	Black beauty	H-3	4	L	Dark velvet crimson		Slocock	
xxx	Blue Diamond G.	H-3	3	E	Blue	'Intrifast' G. X *R. augustinii*	Crosfield	1935
xxx	Blue Peter	H-2	4	M	Pale lavender-blue, deep blotch	?	G. Waterer	

GENERAL LIST OF VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xxx	Blue Tit G.	H-3	3	E	Blue	*R. impeditum* X *R. augustinii*	J. C. Williams	1933
xxx	Bonito G.	H-3	5	L	White, chocolate throat	*R. discolor* X 'Luscombei' G	Rothschild	1934
xx	Bo-Peep G.	H-3	4	VE	Cream, yellow eye	*R. lutescens* X *R. moupinense*	Rothschild	1934
xx	Borde Hill	H-3	5	LM	Dark red	'Doncaster' X 'Mrs. A. M. Williams'	Van Nes	
xxxx	Bowbells G.	H-3	4	EM	Pink	'Corona' X *R. williamsianum*	Rothschild	1934
xx	Break of day G.	H-3	4	M	Pinkish orange	'Dawn's Delight' X *R. dichroanthum*	Rothschild	1934
xxx	Bric-a-Brac G.	H-3	3	VE	White	*R. leucaspis* X *R. moupinense*	Rothschild	1934
xxxx	Britannia	H-3	4	LM	Bright Crimson-red	'Stanley Davies' X 'Queen Wilhelmina'	Van Nes	
xxx	Broughtonii aureum	H-3	4	LM	Yellow	(*R. maximum* X *R. ponticum*) X. *R. molle*	Smith	ca. 1830
xx	Bulstrode Park	H-3	5	M	Dark red	'Sefton' X 41D	Van Nes	
x	Buttercup	H-3	4	EM	Yellow	Campylocarpum Hybrid	Slocock	
xx	Butterfly	H-3	5	M	Pale lemon with chocolate blotch	*R. Campylocarpum* X 'Mrs. Milner'	Slocock	
xx	Canary	H-3	4	EM	Bright yellow	*R. Caucasicum* X Campylocarpum Hybrid	Koster	
xx	(Carex G.) Blush	H-4	4	E	Blush	*R. irroratum* X *R. fargesii*		

xxxx	Carita G.	H-3	5	M	Primrose	'Naomi' G. X *R. campylocarpum*	Rothschild	1935
xxx	Carmen G.	H-4	2	LM	Dark red	*R. didymum* X *R. forrestii var. repens*	Rothschild	1935
xx	Cavalcade G.	H-3	5	L	Bright brick-red	'Essex Scarlet' X *R. griersonianum*	Wat., Sons & Cr.	
xx	C. B. Van Nes	H-4	5	E	Dark Scarlet	'Stanley Davies' X 'Queen Wilhelmina'	Van Nes	
xxx	Chanticleer	H-4	5	EM	Scarlet	*R. thomsonii* X *R. eriogynum*	Rothschild	1935
x	Chevalier Felix de Sauvage	H-3	6	E	Red, with dark spots	Caucasicum Hybrid	Sauvage	ca. 1870
xxx	China G.	H-3	7	M	Pale ochre	*R. wightii* X *R. Fortunei*	Slocock	1940
xx	Chintz	H-3	5	LM	Soft pink with ruby spot	?	G. Waterer	b. 1930
x	Christmas Cheer	H-2	4	VE	Blush pink	Caucasicum Hybrid	Methven	
xxx	Cilpinense G.	H-4	3	VE	Pinkish white	*R. ciliatum* X *R. moupinense*	Aberconway	1927
xx	Conemaugh G.	H-2	4	VE	Lavender-pink	*R. racemosum* X *R. mucronulatum*	Gable	1934
xx	Conestoga G.	H-2				*R. carolinianum* X *R. racemosum*	Gable	1934
xx	Conewago G.	H-2	4			*R. carolinianum* X *R. mucronulatum*	Gable	1934
xxx	Cornish Cross G	H-4	6	EM	Rose-pink	*R. thomsonii X R. griffithianum*	S. Smith	
xx	Cornubia G.	H-5	7	E	Blood-red	*R. arboreum* X 'Shilsonii' G.	Fox	1912
xxx	Corona	H-3	4	LM	Coral-pink	Griffithianum Hybrid	G. Waterer	b. 1910

GENERAL LIST OF VARIETIES

Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
x Corry Koster	H-4	5	EM	Light pink, spotted crimson	'Doncaster' X 'George Hardy'?	Koster	
x Countess of Athlone	H-3	6	EM	Mauve	'Catawbiense grandiflorum' X 'Geoffrey Millais'	Van Nes	
xx Countess of Derby G.	H-3	6	LM	Rose-pink	'Pink Pearl' X 'Cynthia'	White	1913
xx Countess of Haddington G.	H-5	4	M	White, flushed pink	*R. ciliatum* X *R. dalhousiae*	Parker	1862
xx Countess of Sefton G.	H-5	4	M	White	*R. edgeworthii* X *R. multiflorum*	?	
xxx C. P. Raffill G.	H-4	4	L	Scarlet	'Britannia' X *R. griersonianum*	Kew	1943
xx Cunningham's Sulphur	H-3	3	E	Yellow	probably *R. Caucasicum*	Cunningham	
x Cunningham's White G.	H-2	4		White	*R. maximum* X *R. cinnamomeum*	Cunningham	1850
xx Cynthia	H-2	6	LM	Rosy crimson	*R. catawbiense* X *R. griffithianum*	Standish & Noble	1860
xx Dairy Maid	H-3	4	EM	Lemon-yellow, flushed pink	Campylocarpum Hybrid	Slocock	
xxx Damaris G.	H-3	4	M	Pale yellow	'Dr. Stocker' G. X *R. campylocarpum*	Magor	1926
xxx Dame Nellie Melba G.	H-3	6	E	Pink	'Standishii' G. X *R. arboreum*	Sir E. Loder	1926

xxx	David G.	H-3	5	M	Blood-red	'Hugh Koster' X *R. neriiflorum*	Swaythling	1939
xx	Dawn's Delight	H-3	5	M	Brick red changing to soft pink	Griffithianum Hybrid	Mangles	
xxx	Day Dream G.	H-4	4	M	Biscuit to scarlet	'Lady Bessborough' G. X *R. griersonianum*	Rothschild	1936
xxx	Diana	H-3	5	EM	Primrose	'Mrs. Lindsay Smith' X *R. campylocarpum*	Koster	
xx	Devonshire Cream	H-3	3	M	Clear pale yellow with red throat	Campylocarpum Hybrid	Slocock	
x	Dido G.	H-4	3	LM	Pink, shaded orange	*R. dichroanthum* X *R. decorum*	Wilding	1934
xx	Diva G.	H-4	6	L	Carmine, brown spots	'Ladybird' X *R. griersonianum*	Rothschild	1936
x	Dolly G.	H-5	5	EM	Deep reddish pink	'Dawn's Delight' X *R. griersonianum*	Rothschild	1940
xx	Doncaster	H-3	4	LM	Scarlet-crimson		A. Waterer	ca. 1865
xx	Dr. Arnold W. Endtz	H-3	4	LM	Carmine	Griffithianum Hybrid	Endtz	
xxx	Dr. O. Blok	H-3	6	M	Pink edges, paler center	Griffithianum Hybrid	Van Nes	
xxx	Dr. Stocker G.	H-4	5	E	Ivory white	*R. caucasicum* X *R. griffithianum*	North	1900
xxx	Earl of Athlone	H-4	5	EM	Bright blood-red	'Stanley Davies' X 'Queen Wilhelmina'	Van Nes	
x	Edith Mackworth Praed	H-4	6	M	Cherry-scarlet		Koster	
xx	Eldorado G.	H-4	3	E	Creamy yellow	*R. valentinianum* X *R. johnstoneanum*	Rothschild	1937
xxx	Elizabeth G.	H-4	3	EM	Light blood-red	*R. griersonianum* X *R. forrestii* var. *repens*	Aberconway	1939

GENERAL LIST OF VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xx	Elspeth	H-3	3	M	Scarlet bud, fading to apricot		Slocock	
x	Erebus G.	H-4	4	M	Orange	'Fabia' G. X *R. griersonianum*	Aberconway	1936
x	Ernest Gill G.	H-3	5	E	Bright rosy carmine	*R. fortunei* X *R. arboreum*	Gill	1918
xx	Essex Scarlet	H-3	4	L	Deep crimson-scarlet		G. Paul	
x	Eupheno G.	H-3	5	L		*R. sperabile* X *R. griersonianum*	Aberconway	1936
xx	Exoniense G.	H-5	4	EM	White	*R. ciliatum* X *R. veitchianum*	Veitch	1881
xx	(Fabia G.) Tangerine	H-4	4	LM	Orange-salmon	*R. dichroanthum* X *R. griersonianum*	Aberconway	
xx	Tower Court	H-4	4	LM	Light orange-salmon	*R. dichroanthum* X *R. griersonianum*	Stevenson	
xxx	Faggetter's Favourite	H-3	8	M	Silvery pink	Fortunei Hybrid	Slocock	
xx	Fastuosum plenum	H-2	6	LM	Mauve	Ponticum or Catawbiense Hybrid	Francois	b. 1860
xx	F. C. Puddle G.	H-4	5	M	Bright red	*R. neriiflorum* X *R. griersonianum*		1932
x	Fire Bird G.	H-3	5	M	Bright red	'Norman Shaw' G. X *R. griersonianum*		1938
x	Flare	H-4	5	LM	Brilliant salmon-red	('Mrs. R. S. Holford' X *R. auriculatum*) X *R. griersonianum*	Slocock	

xxx	Forsterianum G.	H-5	4	M	White	*R. veitchianum* X *R. edgeworthii*	Forster	1917
xxx	Fragrantissimum G.	H-5	5	LM	White, tinged pink	*R. edgeworthii* X *R. formosum*	Rollisson	1868
xx	Francis Hanger G.	H-4	4	M		*R. dichroanthum* X 'Isabella' G.	Rothschild	1942
xxx	Fusilier G.	H-4	5	M	Scarlet	*R. elliottii* X *R. griersonianum*	Rothschild	1938
xx	Galloper Light	H-3	3	M	Soft, yellowish pink			
x	Garnet G.	H-4	6	M	Deep salmon-rose	*R. griffithianum* X 'Broughtonii'	P. D. Williams	1942
x	G. A. Sims	H-3	5	M	Deep scarlet-crimson		A. Waterer	
xxx	Gill's Crimson	H-5	6	E	Blood-crimson		Gill	
xx	Gill's Triumph G.	H-4	5	EM	Strawberry-red fading to pink	*R. arboreum* X *R. griffithianum*	Gill	1906
xxx	Gladys G.	H-3	5	M	Cream	*R. campylocarpum* X *R. fortunei*	Clarke	1926
xx	Glory of Littleworth	H-4	3	M	Yellow, orange blotch			
xx	Glory of Penjerrick G.	H-4	6		Deep strawberry-red, fading to pink	*R. arboreum* X *R. griffithianum*	Fox	1904
xx	Glowing Embers	H-3	5	L	Scarlet	'Romany Chal' G. X *R. griersonianum*	John Henny	
xxx	Goldfort G.	H-3	5	M	Creamy yellow	'Goldsworth Yellow' G. X *R. fortunei*	Slocock	1937
xx	Goblin G.	H-4	3	LM	Orange-red	'Break of Day' G. X *R. griersonianum*	Rothschild	1939
xx	Golden Horn G.	H-4	3	M	Orange-red	*R. dichroanthum* X *R. elliottii*	Rothschild	1939

GENERAL LIST OF VARIETIES

Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xx Goldsworth Crimson	H-3	5	M	Crimson		Slocock	
xx Goldsworth Orange G.	H-3	5	LM	Pale Orange	*R. dicroanthum* X *R. discolor*	Slocock	1938
x Goldsworth pink	H-4	4		Pink	Griffithianum Hybrid	Slocock	
xx Goldsworth Yellow G.	H-2	4	LM	Apricot-yellow	*R. caucasicum* X *R. campylocarpum*	Slocock	1925
xx Gomer Waterer	H-2	5	L	White, slightly blushed		J. Waterer	
xxx Grenadier G.	H-3	6	VL	Deep blood-red	'Moser's Maroon' X *R. elliottii*	Rothschild	1939
x Grierdal G.	H-5	6	LM	Bright red	*R. dalhousiae* X *R. griersonianum*	Heneage-Vivian	1937
xx Grosclaude G.	H-4	3	M	Blood-red	*R. haematodes* X *R. eriogynum*	Rothschild	1941
xx Halcyone G.	H-3	4	M	Cream	*R. souliei* X 'Lady Bessborough' G.	Rothschild	1940
xx Handsworth White	H-3	5	EM	White	Caucasicum Hybrid	Fisher	
xxx Harvest Moon	H-3	4	M	Creamy white, carmine blotch	'Mrs. Lindsay Smith' X *R. campylocarpum*	Koster	
xxx Hawk G.	H-3	4	M	Yellow	*R. wardii* X 'Lady Bessborough' G.	Rothschild	1940
xx Helene Schiffner	H-4	3	M	White		Seidel	
xx Hugh Koster	H-4	4	M	Bright Crimson		Koster	
xxx Humming Bird G.	H-4	2	EM	Pink, shaded vermillion	*R. haematodes* X *R. williamsianum*	J. C. Williams	1933

x	Hyperion	H-3	5	M	Lilac, deep blotch		G. Waterer	b. 1930
xx	Ibex G.	H-4	4	E	Red	*R. griersonianum* X *R. pocophorum*	Rothschild	1941
xxx	Idealist G.	H-3	5	LM	Pale cream	*R. wardii* X 'Naomi' G.	Rothschild	1941
x	Impi G.	H-3	3	L	Dark red	*R. didymum* X 'Moser's Maroon'	Rothschild	1941
xx	Impeanum G.	H-3	1	E	Lilac	*R. impeditum* X *R. hanceanum*	Kew	1934
x	Indiana G.	H-5	4	L	Crimson	*R. scyphocalyx* X *R. kyawi*	Rothschild	1941
xx	Ivanhoe G.	H-3	4		Orange-salmon	'Chanticleer' G. X *R. griersonianum*	Rothschild	1941
x	Ivery's Scarlet	H-4	5	E	Blood-red			
x	Iviza G.	H-4	3	LM	Orange-scarlet	'Fabia' G. X 'Bustard' G.	Rothschild	1941
x	Jacksonii G.	H-2	3		Rosy pink	*R. caucasicum* X 'Nobleanum' G.	Herbert	1825
xxx	Jan Dekens	H-3	6	LM	Pink	Griffithianum Hybrid	Blaauw	
x	Jasper G.	H-3	4	M	Reddish orange	*R. dichroanthum* X 'Lady Bessborough' G.	Rothschild	1942
xx	Jean G.	H-3	7	LM	Pink to red	*R. griersonianum* X *R. decorum*	Stirling-Maxwell	1936
xxx	J. G. Millais	H-4	6	E	Deep blood-red		J. Waterer	
xxx	J. H. Van Nes	H-4	5	M	Soft red	14 D X 'Monsieur Thiers'	Van Nes	
x	J. J. de Vink	H-4	6	M	Scarlet	'Doncaster' X *R. griffithianum*	Koster	
xxx	Jock G.	H-3	2	EM	Rose-pink	*R. williamsianum* X *R. griersonianum*	Stirling-Maxwell	1939
x	John Walter	H-2	5	L	Crimson	*R. arboreum* X *R. catawbiense*	J. Waterer	b. 1880

GENERAL LIST OF VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xx	Karkov G.	H-4	5	M	Orange-red	*R. griersonianum* X 'Red Admiral' G.	Rothschild	1943
x	King George	H-4	5	EM	Bright red	Griffithianum Hybrid	Van Nes	189-
xxx	King of Shrubs	H-4	5	LM	Apricot flushed pink	? Seed from England	Ostbo	1950
xxx	Lady Alice Fitzwilliam	H-5	4	M	White			
xxx	Lady Bessborough G.	H-3	5	M	Pale yellow	*R. discolor* X *R. campylocarpum* var. *elatum*	Rothschild	1933
xx	Ladybird G.	H-4	5	L	Coral-pink	*R. discolor* X 'Corona'	Rothschild	1933
xxx	Lady Bligh	H-3	5	M	Strawberry-red	Griffithianum Hybrid	Van Nes	
xxxx	Lady Chamberlin G.	H-4	8	M	Orange to salmon-pink	*R. cinnabarinum* var. *Roylei* X 'Royal Flush' G. (orange form)	Rothschild	1930
xx	Lady Clementine Mitford	H-2	4	L	Peach pink, deeper margin		A. Waterer	1870
xx	Lady Eleanor Cathcart G.	H-2	6	EM	Clear pink with chocolate spots	*R. maximum* X *R. arboreum*	A. Waterer	184-
x	Lady Grey Egerton	H-2	5	L	Pale lilac		J. Waterer	ca. 1860
xx	Lady Longman	H-2	7		Deep rose with chocolate eye		White	
xx	Lady Montagu G.	H-4	8	EM	Pink	*R. griffithianum* X ?	Rothschild	1931

xxx	Lady Primrose	H-3	4	M	Lemon-yellow, red spots	Campylocarpum Hybrid	Slocock	
xxxx	Lady Rosebery G.	H-4	8	M	Rosy pink	*R. cinnabarium* var. *Roylei* X 'Royal Flush' G. (pink form)	Rothschild	1930
xx	Lady Stuart of Wortley	H-3	6	M	Pink	Griffithianum Hybrid	Koster	
xx	Langley Park	H-3	4	M	Red	'Stanley Davies' X 'Queen Wilhelmina'	Van Nes	
x	Lavender Girl G.	H-3	4	M	Pale lavender	*R. fortunei* X 'Lady Grey Egerton'	Slocock	1937
x	Leda G.	H-3	3	LM		*R. apodectum* X *R. griersonianum*	Aberconway	1933
xxxx	Letty Edwards G.	H-3	5	M	Pale yellow	*R. campylocarpum* var. *elatum* X *R. fortunei*	Slocock	
xx	Little Ben G.	H-3	1	E	Waxy scarlet	*R. neriiflorum* X *R. forrestii* var. *repens*	Scrase-Dickins	1937
xx	Little Bert G.	H-3	1	E		*R. forrestii* var. *repens* X *R. euchaites*	Scrase-Dickins	1939
x	Little Bill G.	H-3	2			*R. williamsianum* X 'Lady Stuart of Wortley'	Wallace	1934
xx	Lodauric G. (Loderi G.)	H-3	6	L	White	'Loderi' G. X *R. auriculatum*	Crosfield	1939
xxxx	Game Chick	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	
xxxx	King George	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	
xxx	Patience	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	
xxxx	Pink Diamond	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	b. 1914

GENERAL LIST OF VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xxxx	Sir Edmund	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	
xxxx	Sir J. Hooker	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	
xxx	Superlative	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*		
xxxx	Venus	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	
xxx	White Diamond	H-4	7	EM	Blush white	*R. griffithianum* X *R. fortunei*	Sir E. Loder	b. 1914
xxxx	Loder's White	H-4	5	EM	White, frilled	Griffithianum Hybrid	Mangles	
x	Lord Roberts	H-3	5	LM	Dark red, black spots		Mason or Fromow	Ca. 1870
xx	Louis Pasteur (Luscombei G.)	H-3	5	LM	Pink, light center	'Mrs. Tritton' X 'Viscount Powerscourt'	Endtz	
xx	Pride of Leonardslee	H-3	5	EM	Soft pink	*R. fortunei* X *R. thomsonii*	Sir E. Loder	
xx	Mademe de Bruin	H-3	5	LM	Cerise-red	'Doncaster'X'Prometheus'	Koster	
x	Madame Masson	H-2	5	LM	White, yellow blotch	*R. catawbiense* X *R. ponticum*	Bertin	
xx	Madame Fr. J. Chauvin	H-3	6	M	Rosy pink, paler center, deep blotch	Fortunei Hybrid	Koster	
x	Marchioness of Lansdowne	H-2	4	L	Rose, dark eye		A. Waterer	1871
xxx	Margaret Dunn G.	H-3	4	L	Apricot, flushed pink	*R. discolor* X 'Fabia' G.	Swaythling	1946
xxx	Marinus Koster	H-3	6	M	Pink, brown spots	Griffithianum Hybrid	Koster	

xxxx	Mars	H-2	4	LM	Deep true red	Griffithianum Hybrid	G. Waterer	
xx	Mariloo G.	H-4	6	M	Yellow	'Dr. Stocker' G. X *R. lacteum*	Rothschild	1941
xx	Matador G.	H-4	5	EM	Waxy scarlet	*R. griersonianum* X *R. strigillosum*	Aberconway	1939
xxxx	May Day G.	H-3	3	M	Scarlet	*R. haematodes* X *R. griersonianum*	A. M. Williams	1932
xx	Medusa G.	H-4	3	EM		*R. scyphocalyx* X *R. griersonianum*	Aberconway	1936
xx	Mevr. P. A. Colijn	H-3	5	M	Dark pink	Griffithianum Hybrid	Koster	
x	Midsummer	H-3	4	VL	Rose-pink		J. Waterer	
xx	Mohamet G.	H-4	4	E	Red	*R. dichroanthum* X 'Tally Ho' G.	Rothschild	1945
xxxx	Moonstone G.	H-3	2	EM	Cream, edged pink	*R. campylocarpum* X *R. williamsianum*	J. C. Williams	1933
x	Moser's Maroon	H-3	6	L	Maroon		Moser	
xxx	Mother of Pearl	H-4	6	M	Blush, turning snow-white	Sport of Pink Pearl	Wat. Sons & Cr.	
xx	Mount Everest	H-3			White, small red blotch	Griffithianum Hybrid	Slocock	
xx	Mrs. Ashley Slocock	H-3	4		Cream, suffused apricot			
xx	Mrs. A. M. Williams	H-3	5	EM	Bright crimson-scarlet		Van Nes	
xx	Mrs. A. T. de la Mare	H-3	5	M	White with green spot	'White Pearl' X 'Sir Charles Butler'	Van Nes	
xxx	Mrs. Betty Robertson	H-3	4	M	Cream-yellow	'Mrs. Lindsay Smith' X *R. campylocarpum*	Koster	
xx	Mrs. C. B. Van Nes	H-4	5	M	Dark pink	'Florence Smith' X 'Princess Juliana'	Van Nes	
xx	Mrs. Charles Pearson	H-3	6	LM	Blush-mauve, spotted burnt sienna	'Coombe Royal' X Catawbiense grandiflorum'	Koster	

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	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xxx	Mrs. Donald Graham	H-3	6	L	Pink, flushed orange	(*'Corona'* X *R. griersonianum)* X 'Loderi' G.	Ostbo	
xx	Mrs. E. C. Stirling	H-3	5	M	Blush-pink	Griffithianum Hybrid	J. Waterer	
xxxx	Mrs. Furnival	H-3	4	LM	Light pink, sienna blotch	Griffithianum Hybrid	G. Waterer	
xxx	Mrs. G. W. Leak	H-4	6	EM	Pink with brown-purple blotch	'Coombe Royal' X 'Chevalier Felix de Sauvage'	Koster	
x	Mrs. Henry Agnew G.	H-3	3	EM		*R. grande* X *R. arboreum album*	Mangles	1915
xx	Mrs. J. C. Williams	H-3	5	M	Blush, spotted red		A. Waterer	
xx	Mrs. J. G. Millais	H-2	4	EM	White, yellow eye		A. Waterer	
xx	Mrs. Lindsay Smith	H-3	7	LM	White	'George Hardy' X 'Duchess of Edinburgh'	Koster	
xxx	Mrs. Lionel de Rothschild	H-3	5	M	White, red spot		Van Nes	
xx	Mrs. Mary Ashley	H-3	4	LM	Salmon-pink, shaded cream	Campylocarpum Hybrid	Slocock	
xxx	Mrs. P. D. Williams	H-2	4	LM	Ivory-white, brown spot		A. Waterer	
xx	Mrs. Philip Martineau	H-3	5	LM	Rose-pink, pale yellow blotch		A. Waterer	
x	Mrs. R. S. Holford	H-2	5	L	Rosy Salmon	Catawbiense Hybrid	A. Waterer	1866

x	Mrs. T. H. Lowinsky	H-3	4	L	Blush, reddish-brown spots		A. Waterer	
xx	Mrs. Walter Burns	H-3	5	M	Light pink, large bright red blotch	'Standishii' G. X *R. griffithianum*	Lowinsky	
xxx	Mrs. W. C. Slocock G.	H-3	4	M	Apricot-pink shaded to yellow	*R. campylocarpum* X ?	Slocock	1929
xxx	Naomi G. (Naomi G.)	H-2	4	M	Shades of pink	'Aurora' G. X *R. fortunei*	Rothschild	1926
xxx	Astarte	H-2	4	M		'Aurora' G. X *R. fortunei*		
xxx	Carissima	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Early Dawn	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Exbury	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Glow	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Hope	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Nautilus	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Nereid	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Pink Beauty	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Stella Maris	H-2	4	M		'Aurora' G. X *R. fortunei*	Rothschild	
xxx	Nereid G. (Nobleanum G.)	H-3	2	LM	Orange-pink	*R. neriiflorum* X *R. dichroanthum*	Wilding	1934
x	Coccineum	H-3	3	E	Bright scarlet	*R. caucasicum* X *R. arboreum*		
x	Venustum	H-3	3	VE	Pink	*R. caucasicum* X *R. arboreum*		
o	Odoratum	H-3	4	M	Pale Lilac	*R. ponticum* X *R. nudiflorum*	Thomson	1820
x	Oreocinn G.	H-3	2	E		*R. oreotrephes* X *R. cinnabarinum*	Magor	1926
x	Orion G.	H-4	5	M	Rose-pink, red eye	'Phoebus' G. X 'Loderi' G.	Aberconway	1950

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	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xxx	Penjerrick G.	H-5	6	E	White, creamy yellow, or pink	*R. campylocarpum* var. *elatum* X *R. griffithianum*	S. Smith	
x	Peter Koster	H-3	5	M	Crimson	'George Hardy' X 'Doncaster'	Koster	
xxx	Pilgrim G.	H-3	5	M	Soft Pink	*R. fortunei* X 'Gill's Triumph' G.	Rothschild	1926
x	Pink Beauty	H-3	5	M	Pink	'John Walter' X 172 D	Van Nes	
xx	Pink Pearl	H-3	6	LM	Rose-pink, fading to blush	'George Hardy' X 'Broughtonii' ?	J. Waterer	188-
x	Pink Perfection	H-3	5		Pink	'Pink Pearl' X 'Cynthia' ?	Van Houtte	
xx	Polar Bear G.	H-3	6	VL	White	*R. diaprepes* X *R. auriculatum*	Stevenson	1933
xx	Praecox G.	H-3	3	VE	Rosy lilac	*R. ciliatum* X *R. dauricum*	Davies	1860
xx	Princess Elizabeth	H-2	6	LM	Crimson		Wat. Sons & Cr.	
x	Professor F. Bettex	H-2	5	L	Red	'Atrosanguineum' X 'Doncaster'	den Ouden	
xx	Professor Hugo de Vries	H-3	5	LM	Rose-pink	'Pink Pearl' X 'Doncaster'	Endtz	
x	Professor J. H. Zaayer	H-3	4	LM	Bright light red		Endtz	
xx	Purple Emperor	H-3	6	LM	Deep purple		A. Waterer	
xxxx	Purple Splendour	H-2	4	LM	Deep purple, black spot		A. Waterer	
xx	Pygmalion	H-2	4	L	Crimson-scarlet, spotted black		G. Waterer	

xx	Queen 'o the May G.	H-3	5	M	White	'Pink Bell' X *R. griersonianum*	Hamilton	
xx	Queen Wilhelmina	H-3	4	E	Scarlet, fading to rosy pink		Van Nes	1890
xxx	Racil G.	H-3	3	E	Shell-pink	*R. racemosum* X *R. ciliatum*	Holland	1937
xx	Radium G.	H-3	4	M	Blood red	*R. griersonianum* X 'Earl of Athlone'	Crosfield	1936
xx	Rainbow	H-3	4	M	Pink with darker edged petals	Fortunei Hybrid	Slocock	
x	Raoul Millais	H-4	4	EM	Bright pink, lighter center		Koster	
x	Red Cap G.	H-4	2	L	Deep Red	*R. didymum* X *R. eriogynum*	Stevenson	1935
xx	Red Riding Hood	H-3	4	LM	Bright Red	Fortunei Hybrid	Slocock	
xx	Roman Pottery	H-4	4	LM	Orange-Salmon			
xx	Romany Chai G.	H-3	5	L	Orange-scarlet	'Moser's Maroon' X *R. griersonianum*	Rothschild	1932
xxx	Romany Chal G.	H-3	5	L	Orange-scarlet	'Moser's Maroon' X *R. eriogynum*	Rothschild	1932
x	Rosa Mundi	H-3	3	VE	Pale pink	*R. caucasicum* X 'Nobleanum' G. ?		
x	Rosamund Millais	H-3	4	M	Cerise, biotched burnt umber	'George Hardy' X 'Doncaster'	Koster	
xx	Rosy Bell G.	H-3	3	E	Old rose	*R. ciliatum* X *R. glaucophyllum*	Davies	1894
xxx	Rosy Morn G.	H-3	3	LM	Soft pink	*R. souliei* X 'Loderi' G.	White	
xxx	Royal Flush G.	H-4	5	M	Two distinct forms, orange and red	*R. cinnabarinum* X *R. maddenii*	J. C. Williams	
xx	Rubens	H-2	4	LM	Rich deep red		J. Waterer	
xx	Rubina G.	H-5	3	L	Blood Red	*R. didymum* X 'Tally Ho' G.	Crosfield	1938

GENERAL LIST OF VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
xxx	Sapphire	H-3	2	EM	Blue	'Blue Tit' G. X *R. augustinii*	Knap Hill	
xx	Sappho	H-2	5	M	White, heavily spotted		A. Waterer	1870
xx	Sarita Loder G.	H-4	6	LM	Pale salmon-pink	*R. griersonianum* X 'Loderi' G.	G. H. Loder	1934
xx	Scandinavia	H-3	3	LM	Scarlet-crimson		Koster	
xxx	Sir Charles Lemon	H-4	4	E	White			
x	Smithii aureum	H-3	4	LM	Yellow	(*R. maximum* X *R. ponticum*) X *R. molle*	Smith	1830
xxx	Snow Queen G.	H-3	5	M	Pure white	'Halopeanum' G. X 'Loderi' G.	Sir E. Loder	1926
x	Souvenir de Dr. S. Endtz G.	H-3	3	LM	Rosy crimson	'Pink Pearl' X 'John Walter'	Endtz	1924
xxx	Souvenir of W. C. Slocock	H-3	3	M	Primrose-yellow shaded apricot	Campylocarpum Hybrid	Slocock	
xx	Spinulosum G.	H-3	4		Creamy white	*R. spinuliferum* X *R. racemosum*	Kew	1926
xx	Sunrise G.	H-4	6	LM	Pink	*R. griffithianum* X *R. griersonianum*	Aberconway	1933
xxx	Susan	H-2	4	EM	Lavender	*R. campanulatum* X *R. fortunei*	P. D. Williams	
xx	Sweet Simplicity	H-2	5	LM	White, edged clear pink	Ponticum Hybrid	G. Waterer	
xxxx	Tally Ho G.	H-5	5	L	Bright scarlet	*R. griersonianum* X *R. eriogynum*	Crosfield & Lady Loder	1933

xxx	Temple Belle G.	H-3	2	M	Pale rose	*R. orbiculare* X *R. williamsianum*	Kew	1916
x	The Bride	H-2	4	LM	White, greenish spots	*R. caucasicum album*	Standish & Noble	b. 1850
x	The Don	H-3	5	M	Red buds fading to pink	'Doncaster' X *R. griffithianum*	Lowinsky	
xxxx	The Hon. Jean Marie de Montagu	H-3	5	M	Bright crimson		Van Nes	
xx	Thomwilliams G.	H-4	2	E	Deep Pink	*R. thomsonii* X *R. williamsianum*	Magor	1927
xx	Toreador G.	H-4	3			'Arthur Osborn' G. X *R. griersonianum*	Aberconway	1941
x	Trilby	H-2	5	LM	Deep crimson, dark blotch	'Queen Wilhelmina' X 'Stanley Davies'	Van Nes	
xxx	Unique	H-3	3	EM	Pale yellow	Campylocarpum Hybrid	Slocock	
x	Unknown Warrior	H-4	4	E	Bright red	Stanley Davies X Queen Wilhelmina	Van Nes	
x	Ungerio G.	H-4	4	L	Pink to white	*R. ungernii* X *R. eriogynum*	Magor	1933
xx	Vanessa G.	H-4	4	LM	Rose-pink to salmon-pink	'Soulbut' G. X *R. griersonianum*	Aberconway	1929
xx	Vanguard G.	H-4	3	EM	Orange-red	*R. venator* X *R. griersonianum*	Headfort	1940
xxx	Van Nes Sensation	H-3	6	EM	Light pinkish mauve	'White Pearl' X 'Sir Charles Butler'	Van Nes	
xx	Vulcan G.	H-3	4	LM	Brick-red	'Mars' X *R. griersonianum*	Wat. Sons & Cr.	1938
x	White Pearl	H-4	6	M	Blush changing to pure white	*R. griffithianum* X *R. maximum*	Halope	1896
xxx	White Swan	H-4	5	LM	White, suffused delicate pink	*R. decorum* X 'Pink Pearl'	J. Waterer	
x	Zuyder Zee G.	H-4	4	EM	Lemon-yellow, crimson spotted upper petal	'Mrs. Lindsay Smith' X *R. campylocarpum*	Koster	1936

OLD HARDY VARIETIES

	Name	Hard. Rating	Ht. 10 yrs.	Bl. Sea.	Color	Parentage	Originator	Date
x	Album elegans	H-1	6	L	Pale mauve, fading to white	Catawbiense Hybrid	H. Waterer	b. 1850
x	Album grandiflorum	H-2	5	M	Almost white	Catawbiense Hybrid	J. Waterer	b. 1851
x	America	H-1	6	M	Red	'Parson's grandiflorum X ? Hybrid	Koster	
o	Amphion	H-2	6		Red	Catawbiense Hybrid	A. Waterer	b. 1909
x	Atrosanguineum	H-2	5		Bright red	Catawbiense Hybrid	H. Waterer	b. 1851
o	Blandyanum	H-2			Rosy crimson		Standish & Noble	b. 1851
x	Boule de Neige	H-1	4	E	White	*R. caucasicum* X Catawbiense Hybrid	Oudieu	b. 1882
x	Caractacus	H-1	6	L	Purplish crimson	Catawbiense Hybrid	A. Waterer	
x	Catawbiense album	H-1	7	L	White	Catawbiense Hybrid	A. Waterer	b. 1851
x	Catawbiense grandiflorum	H-2	6	LM	Purple	Catawbiense Hybrid	H. Waterer	b. 1851
x	Charles Bagley	H-2	6	L	Cherry red	Catawbiense Hybrid	A. Waterer	1865
x	Charles Dickens	H-1	6	M	Red	Catawbiense Hybrid	A. Waterer	1865
o	Dr. H. C. Dresselhuys	H-2		L	Aniline red	'Atrosanguineum' X 'Doncaster'	den Ouden	1929
o	Dr. H. J. Lovink	H-2		L	Aniline red	'Atrosanguineum' X 'Doncaster'	den Ouden	1929
x	Dr. V. H. Rutgers	H-2	6	M	Aniline red	'Charles Dickens' X 'Lord Roberts'	den Ouden	

o	Edward S. Rand	H-2	5	M	Red, yellow eye	Catawbiense Hybrid	A. Waterer	b. 1880
x	Everestianum	H-2	6	M	Rosy lilac	Catawbiense Hybrid	A. Waterer	b. 1850
x	F. D. Godman	H-2	6	M	Dark red	Catawbiense Hybrid	A. Waterer	1888
x	Henrietta Sargent	H-1	5	L	Rose-Pink	Catawbiense Hybrid	A. Waterer	1891
x	Ignatius Sargent	H-1	6	L	Rose	Catawbiense Hybrid	A. Waterer	ca. 1870
x	Kettledrum	H-1	6	M	Bright crimson	Catawbiense Hybrid	A. Waterer	1877
x	Lady Armstrong	H-1	5	L	Medium rose, light center	Catawbiense Hybrid	A. Waterer	b. 1874
x	Lee's Dark Purple	H-2	5	L	Purple	Catawbiense Hybrid	Lee	b. 1851
o	Madame Carvalho	H-2	6	L	White, greenish spots	Caucasicum Hybrid	Standish	b. 1875
x	Michael Waterer	H-2	6	LM	Bright crimson	Catawbiense Hybrid	J. Waterer	b. 1874
x	Mrs. Chas. S. Sargent.	H-1	6	M	Rose-red, yellow spotted	Catawbiense Hybrid	A. Waterer	1888
o	Mrs. P. den Ouden	H-2	5	M		'Atrosanguineum' X 'Doncaster'	den Ouden	1924
o	Parson's Grandiflorum	H-1	7	M	Purplish rose	Catawbiense Hybrid	Parsons	ca. 1875
o	President Lincoln	H-1	5	M	Lilac	Catawbiense Hybrid	Parsons	
o	Purpureum elegans	H-1	7	L	Purple	Catawbiense Hybrid	H. Waterer	b. 1851
o	Purpureum grandiflorum	H-1	6	M	Purple	Catawbiense Hybrid	H. Waterer	b. 1850
x	Roseum elegans	H-1	6	M	Rose	Catawbiense Hybrid	A. Waterer	b. 1851
o	Roseum superbum	H-2	6	L	Soft rose	Catawbiense Hybrid	A. Waterer	b. 1865

RHODODENDRON SPECIES RATINGS

	Species	Hardiness Rating	Height 10 yrs.	Blooming Season	Color	Series
o	achroanthum	H-2			Magenta-red	Lap.
x	adenogynum	H-2	3	VE	White, magenta tint, crimson spots	Tal.
	agastum	H-4			Deep rose	Irr.
x	agglutinatum	H-3	3		White, tinged rose	Tal.
x	ambiguum	H-4	3	EM	Yellow, spotted green	Tri.
	amesiae	H-4			Purple	Tri.
x	aperantum	H-3	1	LM	White to rose and yellow	Ner.
xx	apodectum	H-4	2	L	Dull orange to crimson	Ner.
xxxx	arboreum	H-4	6	E	White to red	Arb.
x	argyrophyllum	H-3	4	M	White or flushed, pink spots	Arb.
xx	arizelum	H-4	6	EM	White to yellow, crimson blotch	Fal.
x	artosquameum			M	Rose	Tri.
xxx	astrocalyx	H-4	4	EM	Pale yellow	Thom.
xxxx	augustinii	H-3	5	EM	Lavender-rose, blue, to violet	Tri.
xxx	auriculatum	H-3	6	VL	White	Aur.
xx	auritum	H-5	3	E	Pale yellow	Booth.
	baileyi	H-4			Dark, reddish purple	Lep.
o	balfourianum	H-2	3		Pale rose, marked crimson	Tal.
xxxx	barbatum	H-4	7	VE	Crimson-scarlet	Bar.
xx	basilicum	H-3	6	E	Pale yellow, crimson blotch	Fal.
x	bauhiniiflorum	H-4	4			Tri.
xxx	beanianum	H-4		E	Pink to scarlet	Ner.
o	beesianum	H-2	3		White to rose	Lact.
x	brachycarpum	H-2	3	L	Creamy white to pale yellow	Pont.
o	brevistylum	H-4		L	Rose, crimson markings	Hel.
xxxx	bullatum	H-5	3	E	White, tinged pink	Edge.
xx	bureavii	H-2	2	LM	Rose, crimson markings	Tal.
xx	burmanicum	H-5	3	E	Greenish yellow	Mad.

xxxx	caeruleum	H-3	4	M	White to rose-lavender	Tri.
xxx	callimorphum	H-4	3	EM	Rose, crimson blotch	Thom.
xxxx	calophytum	H-3	5	E	White or pink, deep blotch	For.
xxx	calostrotum	H-3	2	EM	Bright magenta-purple	Sal.
xxx	caloxanthum	H-2	3		Sulfur-yellow, tipped orange	Thom.
xxx	campanulatum	H-2	3	E	White to purple	Campan.
xxxx	campylocarpum	H-3	3	M	Canary-yellow	Campcm.
xx	campylogynum	H-2	1	M	Pale to dark rose-purple	Campgm.
x	camtschaticum	H-2	1	M	Reddish purple	Camt.
xx	cardiobasis	H-4			White to rose	For.
xxx	carneum	H-7	3	EM	Whitish pink	Mad.
xx	carolinianum	H-2	3	LM	White to rosy purple	Car.
x	catawbiense	H-1	5	LM	Magenta to whitish	Pont.
x	caucasicum	H-3	5	M	Yellowish or tinted rose	Pont.
xxx	chaetomallum	H-4	3	EM	Deep crimson	Ner.
x	chapmanii	H-3			Rose	Car.
xxx	chartophyllum	H-3	5	EM	Pinkish to nearly white, spotted	Tri.
xxx	chasmanthum	H-4	5	EM	Pale to deep lavender-mauve	Tri.
x	chloranthum	H-4	3	EM	Yellow, tinged green	Tricho.
o	chrysanthum	H-3	1	VE	Pale yellow	Pont.
xx	chryseum	H-2	1	EM	Bright yellow	Lap.
xxx	ciliatum	H-4	2	E	White, or tinged rose	Mad.
xx	ciliicalyx	H-6	4	E	White to rose	Mad.
xxx	cinnabarinum	H-3	4	L	Rosy red	Cin.
xxx	cinnamomeum	H-4	4	M	White to pale rose, spotted	Arb.
xx	citriniflorum	H-4		E	Yellow to yellowish crimson	Ner.
xxx	concatenans	H-4	4	EM	Apricot	Cin.
x	concinnum	H-3	4	EM	Spotted purplish	Tri.
xx	coriaceum	H-4	5	E	White, flushed rose, crimson spots	Fal.
xx	crassum	H-5	4	L	White	Mad.
x	crinigerum	H-2	3	E	White to cream, deep blotch	Bar.
x	cuneatum	H-2	2	E	Rose	Lap.
xx	cyanocarpum	H-4	3	VE	White, cream to rose	Thom.

RHODODENDRON SPECIES RATINGS

	Species	Hardiness Rating	Height 10 yrs.	Blooming Season	Color	Series
xxxx	dalhousiae	H-6	5	M	White, flushed pink	Mad.
xx	dauricum	H-2	4	VE	Bright rose-purple	Daur.
xxx	davidsonianum	H-4	4	EM	Pink, spotted red	Tri.
xxx	decorum	H-4	4	M	White to shell pink	For.
xx	degronianum	H-3	2	EM	Pink	Pont.
xxx	delavayi	H-5	5	VE	White to blood-red	Arb.
xx	desquamatum	H-3	5	E	Mauve spotted	Hel.
o	diacritum	H-3			Rose-purple, white throat	Lap.
xxx	diaprepes	H-4	5	L	White or faintly flushed	For.
xx	dichroanthum	H-4	2	LM	Deep orange to salmon-pink	Ner.
xx	didymum	H-3	2	VL	Black-crimson	Ner.
xxx	discolor	H-3	5	VL	White or pink	For.
xx	drumonium	H-3	1	EM	Mauve	Lap.
	eclecteum	H-3		VE	White, yellow, to deep rose	Thom.
xx	edgeworthii	H-6	3	E	White or tinged pink	Edge.
o	elegantulum	H-2			Purplish pink	Tal.
xxxx	elliottii	H-4	4	LM	Rosy purple to crimson-scarlet	Irr.
xxxx	eriogynum	H-4	3	L	Bright red	Irr.
	euanthum	H-4		LM	White to rose	For.
xxxx	euchaites	H-4	4	EM	Crimson-scarlet	Ner.
o	exasperatum	H-4			Brick red	Bar.
xxxx	eximium	H-4		EM	Creamy white, tinged pink	Fal.
xxx	exquisitum	H-4	4	M	Pale lavender	Tri.
xxxx	falconeri	H-4	6	EM	Creamy white to yellow, purple blotch	Fal.
xxx	fargesii	H-3	4	EM	Pink	For.
xxx	fastigiatum	H-2	1	LM	Light purple	Lap.
x	fauriei	H-3	3		White or yellowish, pinkish flush	Pont.

x	ferrugineum	H-2	2	LM	Rosy crimson	Fer.
xxx	fictolacteum	H-3	6	EM	Creamy white, dark crimson blotch	Fal.
xx	flavidum	H-2	3	E	Pale yellow	Lap.
x	floccigerum	H-3	3	E	Crimson to rose	Ner.
xxxx	forrestii	H-3	1	EM	Bright scarlet	Ner.
xxx	fortunei	H-2	5	LM	Pale pink-lilac	For.
x	fulgens	H-3	3	E	Bright scarlet	Campan.
x	fulvum	H-4	5	E	White to deep rose	Ful.
o	galactinum	H-3	4		White or pale rose, crimson blotch	Fal.
x	glaucophyllum	H-3	2	M	Pale rose	Glau.
x	glischrum	H-4	4	M	Magenta-pink, crimson blotch	Bar.
x	glomerulatum	H-3	2	LM	Light purple-mauve	Lap.
xxx	grande	H-5	6	E	Creamy-white, purple blotch	Grande
xxx	griersonianum	H-5	3	L	Geranium-scarlet	Aur.
xxxx	griffithianum	H-5	6	M	White, green spots	For.
xx	gymnocarpum	H-3	3	E	Claret-crimson	Tal.
x	habrotrichum	H-4	4	M	White or pale rose	Bar.
xx	haemaleum	H-3	3	E	Black-crimson	Ner.
xxxx	haematodes	H-4	2	LM	Scarlet-crimson	Ner.
x	heliolepis	H-3	5	L	Almost white to rosy-purple	Hel.
x	hemitrichotum	H-3	2	EM	White or pale pink	Scab.
xxx	hippophaeoides	H-3	2	EM	Pale lilac to rose	Lap.
x	hirsutum	H-2	1	L	Rose-pink to nearly scarlet	Fer.
x	hodgsonii	H-4	5	E	Magenta-purple	Fal.
xx	houlstonii	H-3	5	M	White to pale pink	For.
xxx	impeditum	H-2	1	EM	Light purplish blue	Lap.
xx	imperator	H-3	1	M	Pinkish purple	Uni.
xxx	insigne	H-4	2	LM	Pinkish white, crimson spots	Arb.
xx	intricatum	H-2	2	EM	Mauve	Lap.
xx	irroratum	H-4	3	VE	White or cream, suffused rose	Irr.
xxx	johnstoneanum	H-4	3	E	Pale yellow	Mad.
xxx	keiskei	H-2	3	VE	Lemon yellow	Tri.

RHODODENDRON SPECIES RATINGS

	Species	Hardiness Rating	Height 10 yrs.	Blooming Season	Color	Series
xxx	keleticum	H-2	1	LM	Purplish crimson	Sal.
xx	keysii	H-4	4	L	Bright red, tipped yellow	Cin.
xxxx	kyawi	H-6	5	VL	Crimson	Irr.
x	lapponicum	H-2	1		Purple	Lap.
xx	lepidotum	H-3	2	L	Yellow, pink or purple	Lep.
xxxx	leucaspis	H-4	1	VE	Milky white	Booth.
xxxx	lindleyi	H-6	5	EM	White, flushed rose	Mad.
x	litangense	H-2	2	E	Dull plum-purple	Lap.
xxx	litiense	H-4	4	EM	Yellow	Thom.
xx	longesquamatum	H-3			Pink to rose, blotched crimson	Bar.
xxx	lutescens	H-4	5	VE	Pale yellow, spotted light green	Tri.
xxxx	macabeanum	H-4	6		Yellowish white, blotched purple	Grande
x	macrophyllum	H-2	6	L	White to purplish rose, yellow spots	Pont.
xxx	maddenii	H-6	4	L	White	Mad.
xx	makinoi	H-3	3	EM	Soft pink	Pont.
xxx	mallotum	H-4	3		Dark crimson	Ner.
x	maximum	H-1	5	L	White to rose-purple, yellow-green spots	Pont.
	megacalyx	H-6		EM	White	Mad.
xx	megeratum	H-4	2	E	Bright yellow	Booth.
x	micranthum	H-1	4	L	White	Mic.
xx	microleucum	H-2	2	M	White	Lap.
x	minus	H-2	5	LM	Rose	Car.
xxxx	moupinense	H-4	2	VE	White	Mou.
xx	mucronulatum	H-2	5	VE	Rosy purple	Dau.
xx	myrtilloides	H-3	1	EM	Plum	Campgm.
xxxx	neriiflorum	H-4	3	E	Bright scarlet	Ner.

xxxx	nuttallii	H-6	6	EM	Light yellow	Mad.
xx	oleifolium	H-3	4	EM	Pink to almost white	Vir.
xxx	orbiculare	H-3	2	E	Rose-pink	For.
xx	oreodoxa	H-3	3		Pink	For.
xxx	oreotrephes	H-3	3	M	Mauve or mauve-pink	Tri.
xx	pachytrichum	H-3			White to rose, purple blotch	Bar.
xxx	pemakoense	H-3	1	E	Pinkish purple	Uni.
	polyandrum	H-6	4	LM	White to pale yellow	Mad.
o	polylepis	H-3	4	E	Dark purple	Tri.
o	ponticum	H-3	5	LM	Purplish	Pont.
xx	praevernum	H-3	4	VE	White, wine red blotch	For.
xx	prostratum	H-3	1	M	Pink-violet	Sal.
xx	pseudoyanthinum	H-3	4	LM	Purple	Tri.
xx	pubescens	H-3	3	M	Pinkish white	Scab.
xxxx	racemosum	H-2	3	EM	White to pink	Vir.
xxx	radicans	H-3	1	M	Purple	Sal.
x	ravum	H-2	2	M	Deep rose	Lap.
xxx	rhabdotum	H-6	5	M	Cream, striped red outside	Mad.
x	riparium	H-3	1	M	Bright purple	Sal.
x	ririei	H-4	5	VE	Dull purple	Arb.
xx	rubiginosum	H-2	5	EM	Rosy lilac, spotted brown	Hel.
xxxx	russatum	H-2	3	M	Deep purple, white throat	Lap.
xx	saluenense	H-3	2	LM	Purple crimson	Sal.
xxx	sanguineum	H-3	2	M	Bright crimson	Ner.
xxxx	sargentianum	H-3	1	EM	Lemon yellow	Anth.
o	scabrifolium	H-3			White to pink	Scab.
xx	scintillans	H-3	2	EM	Lavender-blue	Lap.
o	scyphocalyx	H-4	3	L	Rose-orange to yellow	Ner.
xx	searsiae	H-3	4	EM	White to mauve	Tri.
x	semilunatum	H-4	3	EM	Deep yellow	Tricho.
xx	semnoides	H-4	5		Flushed white, crimson blotch	Grande
	shweliense	H-3	3	LM	Pink, tinged yellow, purple spots	Glau.
xxxx	sinogrande	H-4	5		Creamy white, crimson blotch	Grande
x	smirnowi	H-2	3	M	Purplish rose	Pont.

RHODODENDRON SPECIES RATINGS

Species	Hardiness Rating	Height 10 yrs.	Blooming Season	Color	Series
xxx smithii	H-3	5	E	Scarlet-crimson	Bar.
xxx souliei	H-3	4	M	White to deep rose	Thom.
xx sperabile	H-4	2	E	Scarlet	Ner.
xx sperabiloides	H-4	2		Deep to light crimson	Ner.
xx spiciferum	H-3	2	EM	Pink	Scab.
xx spinuliferum	H-4	3	M	Crimson to brick red	Scab.
xxx stewartianum	H-4			White, yellow, crimson	Thom.
xxx strigillosum	H-4	3	E	Crimson-scarlet	Bar.
xxx sutchuenense	H-3	5	VE	Pale rosy lilac	For.
xxx taggianum	H-6	5	EM	White, yellow blotch	Mad.
xx telmateium	H-3			Rosy purple, white throat	Lap.
xxx tephropeplum	H-4	2	EM	Magenta-rose	Booth.
xxx thomsonii	H-3	5	E	Blood red	Thom.
x trichocladum	H-4	3	EM	Greenish yellow, spotted green	Tricho.
xxx trichostomum	H-4	1	M	Rose to white	Anth.
o triflorum	H-3	4		Light yellow, spotted green	Tri.
x ungernii	H-4	3	VL	Pinkish white	Pont.
o uvarifolium	H-3			White to pale rose, may be spotted	Ful.
xx valentinianum	H-5	2	E	Butter-yellow	Mad.
xx venator	H-4	3	LM	Scarlet	Irr.
xx vernicosum	H-3	4	LM	Pink	For.
xx vilmorinianum	H-4		EM	White, ochre-colored spots	Tri.
xxxx wardii	H-4	3	M	Yellow, sometimes a crimson blotch	Thom.
xxxx williamsianum	H-3	1	E	Clear shell pink	Thom.
x wilsonae	H-3	3	L	Flesh-pink	Stam.
xxx xanthocodon	H-3	4	M	Cream-yellow	Tri.
xx xanthostephanum	H-4	3	M	Bright yellow to green-yellow	Booth.
xxx yakusimanum	H-3	2	M	Pale rose	Pont.
xxxx yunnanense	H-3	5	EM	Pinkish white, spotted red	Tri.

VARIETIES FOR SPECIFIC USES AND LOCALITIES

One of the most important factors in having Rhododendrons which will provide a maximum of beauty to the landscape and enjoyment to the gardener, under a given set of environmental conditions, is to have the best possible varieties for those conditions. Although the Committee did not deem it wise to try to put together a set of variety recommendations it did ask a number of competent growers to suggest 5 varieties as their own preferences for particular uses or places and is most grateful to those who have helped with this project. A study of the following lists should be helpful to anyone interested in Rhododendrons, although not all conditions are covered, and the address of the person making the suggestions is very significant in any use to be made of the lists.

Very Early Blooming varieties suggested by Mrs. Ruth M. Hansen, Portland, Ore.

PINK—'Carex Blush', early Mar., med. grower, lax truss. 'Cilpinense', pink to white, low growing. 'Dame Nellie Melba', deep pink, large plant, best of early hybrids, blooms mid. Apr. 'Lady Montague', deep pink, large plant. 'Nobleanum coccineum', bright pink.

WHITE—'Bric-a-Brac', mid. Feb. to Mar., low grower, needs protection from frost. *R. calophytum*, deep blotch. March, tree type, beautiful foliage. 'Dr. Stocker', creamy white, mid. Apr., good woodland plant. *R. leucaspis*, early Mar., dwarf, spreading, best of species. 'Snow Lady', mid Apr., profuse bloomer, best dwarf hybrid in this group.

RED—'Cornubia', blood-red, late Mar., large plant. *R. sperabile*, crimson, mid. Apr., low grower. *R. neriiflorum*, scarlet, mid. Apr., small shrub, lax truss very striking. 'Gill's Crimson', blood-crimson, early Apr., tall, good truss. 'Wilbar', dusty rose, early Apr., good rockery type.

YELLOW—'Bo-peep', creamy yellow, mid. Mar., upright, needs protection from frost. 'Diane', primrose yellow, late Apr., tall, good truss, possibly best of all yellows. *R. keiskei*, lemon yellow, early Apr., med. growing. *R. lutescens*, primrose yellow, upright, excellent species. 'Unique', pale yellow, late Apr., low growing, excellent foliage and flowers.

Photo Rudolph Henny

The Exbury form of 'Naomi' G. grown by Rudolph Henny, Brooks, Ore.

LAVENDER—'Conemaugh,' rose lavender, bushy upright grower. *R. desquamatum*, mauve, upright, excellent for hedge or background. *R. mucronulatum*, rosy lavender. Feb. and Mar., deciduous. *R. sutchuenense*, rosy lilac, Feb. and Mar., tree type, beautiful specimen. 'Tessa', rosy lavender, upright, good flowers and foliage.

BLUE—'Blue Tit', dwarf to 4 ft., good for border or specimen. *R. campanulatum*, almost blue, large, interesting foliage. *R. augustinii*, best of all blue Rhododendrons, tall, mid. Apr. 'Blue Diamond', best of blue dwarfs, bushy, Apr.

SPLOTCHED—'Mrs. G. W. Leak', pink, brown blotch, late Apr., tall, excellent truss and foliage.

Best Dwarfs, low growing plants usually staying under 4 or 5 feet in height, which fill the needs of modern, low built western homes as suggested by Robert Bovee, Oswego, Ore.

'Bow Bells', one of the really fine rhododendrons. Beautiful rounded leaves, compact, fine pink flowers. In many years it may grow 3 ft. tall. 'Moonstone', a companion plant to Bowbells, creamy yellow, more compact growing but has same fine foliage. Needs plenty of sun

for heavy budding. 'Elizabeth', said to be the most heavily blooming Rhododendron, will often set buds when only a year old. Good foliage and growth habits and fine red flowers. 'Blue Tit', blue-green leaves and very dense growth. Light blue flowers literally cover the plant. Usually grows about 3 ft. tall. 'Cilpinense', dark green, hairy leaves and fine habit of growth. Blooms in April. Buds are red and flowers pinkish white.

Best for the Rockery. Robert Bovee, Oswego, Ore. Practically all of the very low growing, small leaved rockery Rhododendrons need full sun for compact growth. In the shade they send out long straggly shoots and make miserable plants.

R. pemakoense, even small plants bloom so heavily they hide the foliage. Nice foliage, large pinkish-purple flowers. Very compact. In 12 years one of our plants is not over ten ins. tall and has formed a perfectly rounded bush more than 2 ft. across. *R. impeditum*, in full sun it forms a compact mound a few inches tall. In the best forms flowers are purplish-blue. Heavy bloomer. 'Carmen', a hybrid with glistening, waxy, deep red bells. Nice foliage and low growing. 'Sapphire', the best blue we have seen in a Rhododendron. Needs full sun for compact growth. *R. tephropeplum*, dainty pink bells on a fine low growing bush. *R. deleiense*, now merged with *R. tephropeplum*, has larger flowers and leaves.

Best Very Late Blooming varieties as seen by Mrs. Ruth M. Hansen, Portland, Ore.

Pink—'Lady Clementine Mitford', peach pink, June, compact truss. 'Midsummer', rose pink, June-July, tall grower. 'Westward Ho', deep pink, June-July, tall grower, very colorful. *R. Wilsonae*, deep pink, small shrub to 6', good for mass planting. 'Mrs. Walter Burns', light pink, red blotch, tall, good background plant.

White—'Albatross', fragrant, large flowers, tree type. 'Bonito', good truss, June, tall growing. *R. crassum*, fragrant, tender. 'Lodauric', July, tree type. *R. micranthum*, small white flowers, dense shrub to 6 ft., July.

Red—'Arthur Osborn', deep scarlet, low, spreading, good border or rockery plant. 'Glowing Embers', scarlet, beautiful truss, good plant, medium growing. 'Indiana', deep crimson, waxy bells, excellent flowers and foliage. 'Romany Chal', scarlet, loose growing, tall, good for woodland. 'Tally-Ho', bright scarlet, tall, good for woodland planting.

Orange-Salmon—'Azor', soft salmon, tall, a most outstanding

Photo Kuwolph Henny

A nice plant of 'Mrs. Furnival' in Mr. Henny's garden.

Rhododendron. 'Goldsworth Orange', deep orange, beautiful copper effect in border. 'Fabia', orange-salmon, slow-growing to 5 ft., lax truss. 'Sarita Loder', salmon-pink, tall, beautiful truss, 'King of Shrubs', orange-salmon, medium grower, good flower and foliage.

LAVENDER—'Gomer Waterer', pale lavender, large but compact, good for background or specimen. 'Mahmoud', deep lavender, yellow blotch, medium grower. 'Lavender Girl', pale lavender, tall.

SPLOTCHED—'Hyperion', lilac, chocolate blotch, small truss, tall. 'Mrs. J. C. Williams', blush, spotted red, tall truss, excellent. 'Mrs. Lionel de Rothschild', white, red spot, beautiful truss. 'Mrs. P. D. Williams', white, brown spot, large growing. 'Mrs. T. H. Lowinsky', blush, reddish-brown spot, tall, rangy, good background plant.

Five Best Large Leaved Varieties or Species, as suggested by Cecil Smith, Aurora, Ore. The large leaved species should be grown in shade during the hot part of the day, say from 9 or 10 A.M. to 5 P.M. Quality of foliage should not be sacrificed for more flowers. I like to see them with a single trunk.

Photo J. Harold Clarke

Truss of *R. fictolacteum* on a fine plant in the garden of Rudolph Henny, Brooks, Ore. This is one of the large leaved species.

R. sinogrande is the largest leaved Rhododendron. Leaves may be two ft., or better in length. The young leaves are silvery as they emerge and remain that color for two or three weeks as they develop. *R. fictolacteum* has leaves a foot long, dark green and glossy on top with a glowing, red-brown padding underneath. *R. calophytum* has many long slim leaves which form a large funnel shaped collar at the apex of each branch, creating an interesting pattern. *R. rex* has leaves dark and smooth on top and tan to gray below. It has a very sturdy branching habit which gives the tree character and interest. *R. falconeri* is as fine a foliage Rhododendron as we have if the growing conditions are favorable. Vein and veinlets are depressed

Photo Cecil Smith

R. sinogrande (Rock No. 182) in garden of Cecil Smith, Aurora, Ore.

making the upper surface very rough. The under surface is clad with a thick rusty padding, perhaps the finest indumentum in the genus.

Best Species for Specimen Plants, according to Cecil Smith, Aurora, Ore. A Rhododendron can be found that will serve very well as a specimen in about any shape or size or foliage texture needed.

R. sutchuenense is pyramidal with foliage to the ground, very long narrow leaves. Plants twelve feet high are still growing strongly. Fine flowers in Feb. or Mar. *R. yakusimanum* makes a dome-shaped shrub. The new growths are but two or three inches long and frosty white as the leaves unfold. Corolla pale pink turning to white, waxy and with great substance. A top Rhododendron in foliage, plant habit

and flower. *R. mallotum* has a rich red-brown indumentum appearing to the eye like that of *R. falconeri*. It can make a sturdy, branched, small gnarled tree with a lot of character. *R. lepidostylum* grows not more than an inch a year, is very compact and the new leaves are a striking blue-green, acquiring a bit of purple in the winter. *R. bureavii* grows three or four inches a year and has dense, dark, thick leaves with bright reddish wool underneath. Tops as a medium sized foliage plant.

Best Species for Background Planting, as suggested by Cecil Smith. Aurora, Ore. *R. fortunei* will grow 8 to 12 inches per year with leaves 8 inches long. Selected forms have fine large flowers. *R. discolor* has foliage and growth habits similar to *R. fortunei* and has large white flowers in early July. *R. arboreum* needs to be selected for hardiness. I know of two batches of seedlings which withstood below zero temperatures. Very distinctive in foliage and habit. *R. auriculatum* has bold leaves a foot or more long and plants 12 feet high are still growing vigorously. It has white flowers late in July. *R. rubiginosum* has leaves two or three inches long, quickly makes a tall, wide, dense bush, sprouting from the base. Flowers lavender-pink in Apr., as thick as those of a flowering cherry.

Rhododendrons for Fragrance, liked by Dr. Paul Bowman, Fort Bragg, Cal. *R. edgeworthi*, a straggling shrub, 6 to 8 feet, leaves wrinkled above, tawny felt beneath. Flowers very large, widely funnel shaped, tinged pink rose, richly fragrant. 'Fragrantissimum', a hybrid of *R. edgeworthi* which it closely resembles, is more compact, but should be controlled by pruning. The most popular and best known fragrant Rhododendron. *R. maddeni*, of compact growth to 9 ft., with beautiful dark green, scaly leaves and large funnel shaped, heavily scented flowers, white, some times flushed rose. 'Princess Alice' is another hybrid of *R. edgeworthi*, hardier and more compact than 'Fragrantissimum'. *R. ciliicalyx* is a species growing to 10 feet, with bristly leaves and petioles. The flowers are white, flushed with rose and yellow and deliciously fragrant.

Best Rhododendrons for the Conservatory, as suggested by Dr. Paul Bowman. Fort Bragg, Cal. *R. lindleyi*, cane-like in growth but flowers are enormous, marble-white, broadly funnel shaped and with exquisite exotic fragrance. 'Victorianum' is a glorified, magnified. *R. dalhousiae*, growing more compactly, and of better habit. *R. dalhousiae* grows 10-12 feet, of straggly habit but with beautiful trum-

pets, at first chartreuse, then yellowish, and finally white in color. The form usually obtainable on the Pacific Coast has very little fragrance. *R. nuttalli* is an erect shrub or tree with large, reticulate leaves. Flowers large, ivory white, broad funnels with golden yellow throat, tinged outside with rose pink. They are of heavy texture, and with some fragrance. (Loderi G.) 'Venus', shows its parentage in very large trusses, very large flowers, pink in bud, then suffused with yellow and finally pure white. The flowers also have some fragrance.

Best for Pot or Tub Culture, as seen by Dr. Paul Bowman, Fort Bragg, Cal. 'Countess of Haddington' blooms profusely, and has waxy, tubular, fragrant white flowers, flushed with yellow and rose. 'Elizabeth' is low, compact, spreading, and is covered with large red flowers, one of the newest favorites. 'Bowbells' has distinctive, glossy, roundish, small leaves. The flowers are bell shaped, soft pink to deep pink, in loose clusters. 'Cilpinense' is compact, spreading and has all the good features of its parent *R. ciliatum,* without the straggliness and the dull color of the leaves. 'Forsterianum', a compact grower with light green leaves and covered with large, frilled, white flowers with a greenish blotch in the throat.

For the Seattle Area, Donald Graham, of that City, likes the following. 'Loder's White', white. 'Mrs. Donald Graham', pink. 'The Hon. Jean Marie de Montagu,' red. *R. augustinii,* lavender. *R. campylocarpum* var. *elatum,* yellow. As a second choice he would suggest 'Snow Queen', white. 'Mrs. Furnival', pink. 'C. B. van Nes', red. 'A. Bedford', lavender. *R. hanceanum* var. *nanum,* a dwarf yellow.

For the Spokane Area, Larry Krause suggests 'Dr. Rutgers', 'Lord Roberts', 'Purple Splendour', 'Gomer Waterer', 'Mrs. C. S. Sargent', 'Mars', 'Old Port', 'Dr. Dresselhuys'. The following grow around Spokane but require special protection, 'Pink Pearl', 'Goldsworth Yellow', 'Letty Edwards'.

Varieties for the Boston Area preferred by Dr. Donald Wyman of the Arnold Arboretum. 'Henrietta Sargent', 'Purpureum elegans', 'Album grandiflorum', 'Charles Dickens'. Besides these Catawbiense Hybrids, Dr. Wyman likes the Fortunei Hybrids, originated by C. O. Dexter, and the following species. *R. carolinianum, R. laetevirens* (given in the R. H. S. Handbook as *R. concinnum*), and *R. smirnowii* which has such dense pubescence on the under surface of the leaves that the lacebug does not like it.

For the Washington, D. C. region, Dr. Henry T. Skinner, Director of the United States National Arboretum likes these. 'Album grandiflorum', 'America', 'Cynthia', 'Gomer Waterer', 'Purple Splendour', 'Roseum superbum' (or 'English elegans'). 'Vulcan' is flowering nicely but needs more testing for hardiness.

For the Midwest, Harry V. Seevers, Ottawa, Kansas, likes three varieties which have taken —10° F. 'Gomer Waterer', 'Purpureum grandiflorum', 'Catawbiense album'. He likes 'America' but so far it has only had to take zero. Mr. Seevers grows his Rhododendrons under lath in a mixture of 1 part sand and 3 parts well decomposed saw dust.

Ironclads liked by Dr. Clement Bowers, Maine, N. Y. He lives in a part of the country where —25° F. is not unusual and says that while these are all "ironclads" not all of them can be expected to thrive at that temperature. 'Atrosanguineum', 'Boule de Neige', 'Catawbiense album', 'Charles Dickens', 'Everestianum', 'Henrietta Sargent', 'Kettledrum', 'Lady Armstrong', 'Mrs. C. S. Sargent', 'Roseum elegans'.

For San Francisco, Mr. Roy L. Hudson, of the Recreation and Park Department at Golden Gate Park indicated it "was a pleasure to send the list but a devilish decision to make." 'Forsterianum.' If I could have only one Rhododendron, this would be it. Beautiful and unfailing in bloom, of good size and habit, easy to grow and propagate. 'Pink Pearl' is an outstanding park plant. Not yet excelled in beauty and vigor and all around quality in this region. 'The Hon. Jean Marie de Montagu', bids fair to top the field. (Loderi G.) 'Venus', utter perfection of flower, worth space and effort to grow well. Wind our worst enemy. *R. burmanicum,* wonderful for mass planting, highly regarded by fanciers of this area.

Among the large estate types I favor 'Cynthia', 'Beauty of Littleworth', (Cornubia G.) 'John McLaren', 'Mother of Pearl', and 'White Pearl'. The medium size group would contain 'Gill's Crimson', 'Unknown Warrior', 'Langley Park', 'Mrs. Furnival', 'Mrs. G. W. Leak', 'Susan', 'Countess of Haddington', and 'Macnabianum.' My particular favorites are among the dwarfs and species. I like 'Corona' 'Bowbells', 'Blue Diamond', 'Sapphire', 'Cilpinense', 'Bric-a-Brac' *R. augustinii* and *R. yunnanense.* "This still leaves a hundred or so that intrigue me. Five best? Impossible!"

Rhododendrons for Cut Flowers have not been used as much as they deserve. Mrs. Ruth M. Hansen, Portland, Ore., suggests the following because each bears small or loose trusses found to be more graceful in flower arranging. All of these have proven themselves as good cut flowers.

PINK—'Bowbells', *R. davidsonianum*, 'Lady Mary Ashley', *R. racemosum*, *R. tephropeplum*.

WHITE—*R. ciliatum*, *R. decorum*, *R. discolor*, 'Helene Schiffner', *R. yunnanense*.

RED—'Fusilier', 'Glowing Embers', 'Goblin', 'J. H. van Nes', *R. neriiflorum*.

YELLOW—*R. campylocarpum*, 'Damaris', 'Goldsworth Yellow', *R. lutescens*, 'Unique'.

GREEN—*R. ambiguum*, *R. brachyanthum*.

PURPLE—*R. pseudoyanthinum*, 'Purple Splendour', *R. russatum*.

BLUE—*R. augustinii*, 'Blue Peter', 'Blue Tit', *R. impeditum*, *R. scintillans*.

LAVENDER—*R. desquamatum*, 'Everestianum', *R. hippophaeoides*, *R. oreotrephes*.

SPLOTCHED—'Mrs. G. W. Leak', 'Mrs. T. H. Lowinsky', 'Pygmalion', 'Rosamund Millais', 'Mrs. Walter Burns'.

Not Enough Space

As this book developed some of the planned features required more space than had been anticipated. It seemed necessary, therefore, to omit the following which, it is hoped, may appear at some future date in the American Rhododendron Society Bulletin.—1. The revised A.R.S. By-laws. 2. List of varieties and species in the Test Garden in Portland. 3. Bibliography of Rhododendron literature.—EDITOR

Photo J. Harold Clarke

Rhododendrons growing under towering firs, Test Garden, Portland, Ore.

GLOSSARY

C. T. HANSEN

The study of Rhododendrons, especially the species, is fairly complex for the amateur who does not have the proper background. The descriptive terms used in the "Species" book are usually beyond the scope of the ordinary layman. In trying to track down a species, I usually arm myself with a dictionary and two or three other horticultural books having glossaries. Finding this too cumbersome when I wanted to track down a single leaf, I finally started my own glossary.

One day, not so long ago, I happened to tell the editor of this book about my project. He thought such a glossary might be useful to others and asked to use it, so here it is. Remember—it is not intended as a scientific treatise but only as a layman's help for other laymen.

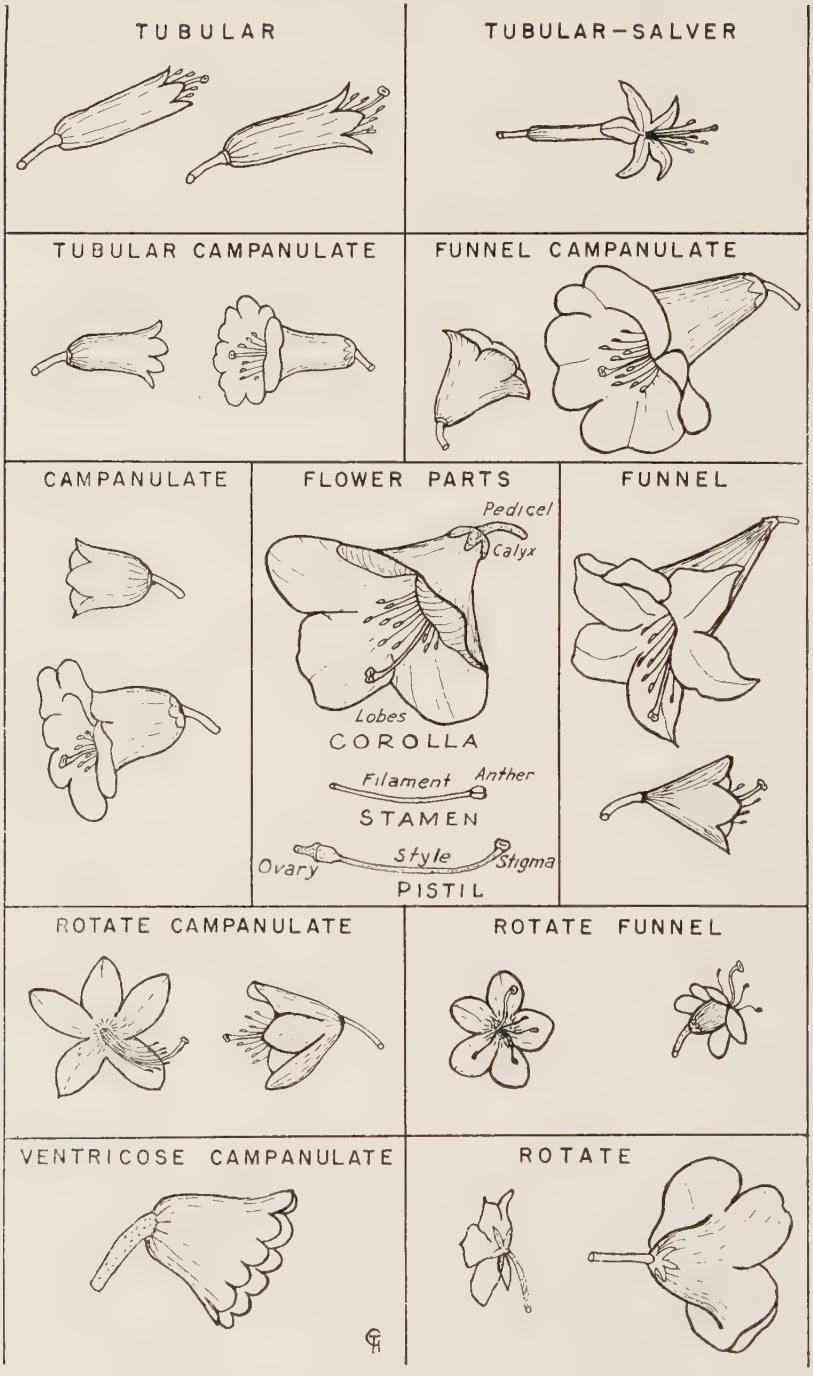
Aberrant. Differing from the common type.
Acuminate. Tapered to a long point.
Acute. Sharply pointed but not long tapered.
Adpressed. Growing in contact with a stem but not adhering to it.
Agglutinate. Joined by adhesion.
Alveolate. Full of hollow cells; honeycombed.
Annular. Ring shaped; marked with rings.
Anther. The part of the stamen that bears pollen.
Anthesis. The time of expansion of a flower.
Apex. Tip or free end.
Apices. Plural of apex.
Appressed. Pressed closely against.
Aristate. Having a beard-like or bristled appendage; awned.
Attenuate. Thin; small or fine; slenderly tapering.
Auricle. An ear-shaped appendage.
Auriculate. Bearing auricles.
Axil. The angle between a leaf and a stem.
Axillary. Borne in an axil.

Basal. Pertaining to or at the base.
Bistrate. Two-layered.
Bract. A modified, reduced leaf in a flower cluster.
Bracteole. A little bract, on a pedicel.
Bullate. Having a blistered or puckered appearance.

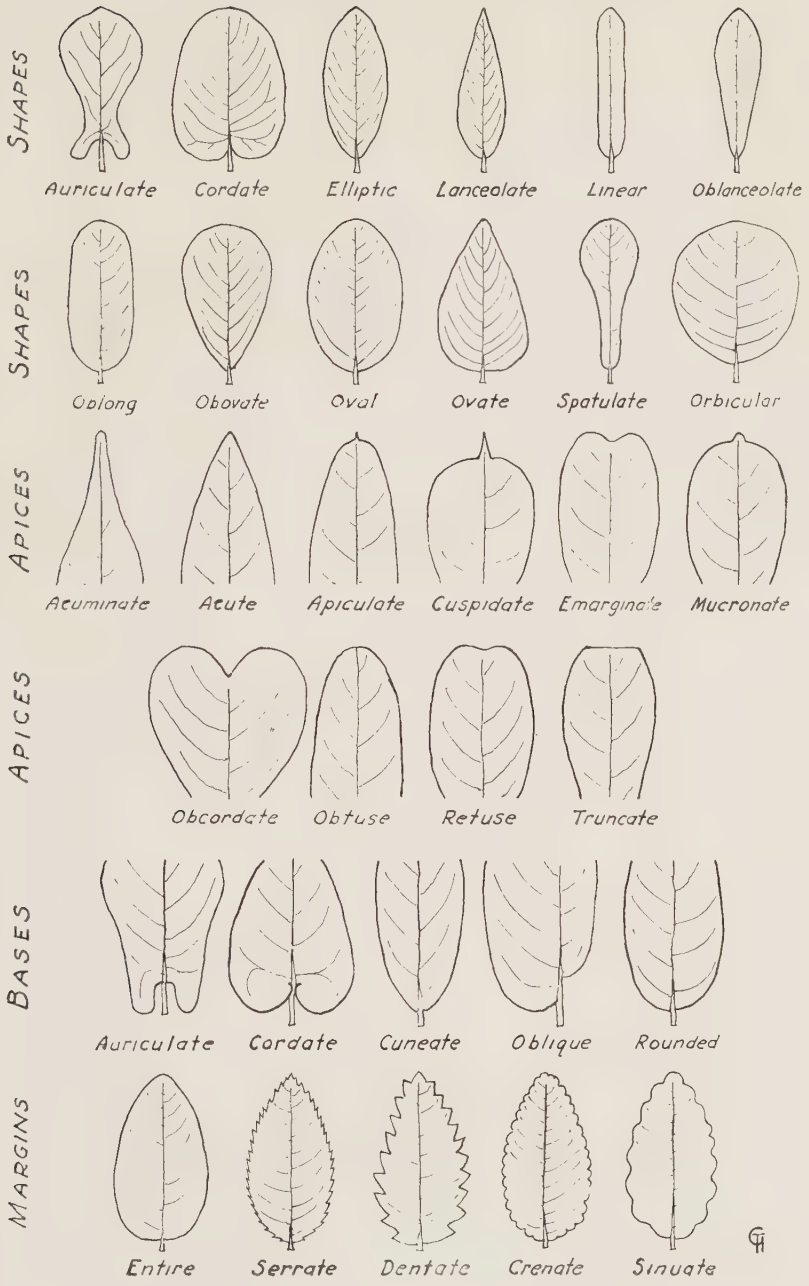
Calyx. The outer set of parts (sepals) of a complete flower at the base of, and external to the corolla.
Campanulate. Bell-shaped; cup shaped.
Candelabroid. Shaped like a candelabra.
Canescent. With gray pubescence.
Capitate. Collected into a head or dense cluster.
Capsule. A dry seed vessel splitting at maturity.
Cartilaginous. Gristly.
Cespitose. Growing in tufts.
Chartaceous. Writing paper texture
Cilia. Small, sometimes microscopic, hair-like processes.
Ciliate. Fringed with hairs.
Ciliolate. Minutely ciliate.
Clavate. Club-shaped.
Clone. A horticultural variety propagated asexually, by cuttings, grafts, or layers, and not by seed.
Cm. Abbreviation for centimeter, approximately two-fifths of an inch.
Conic. Cone-shaped; conical.
Conoid. Nearly conic.
Contiguous. Adjacent; joined at the edge.
Convex. Curved outward, as the outer surface of a sphere; opposed to concave.
Cordate. Heart-shaped, with two rounded lobes at the base.
Coriaceous. Leathery in texture.
Corolla. The part of the flower just outside the stamens, usually colored, and consisting of separate or more or less united petals.
Corymb. Cluster of flowers, flat-topped due to unequal length pedicels and flowering from the margin inward.
Corymbose. Borne in a corymb.
Crenate. Dentate with rounded teeth.
Crenulate. Minutely crenate.
Crispate. Having a crisp or curled appearance.
Crustaceous. Of hard and brittle texture.
Cultivar. Horticultural variety or group.
Cuneate. Wedge-shaped.
Cupular. Cup-shaped.
Cuspidate. Tipped with a sharp, stiff point.
Cylindric. Shaped like a cylinder.

Deciduous. Falling off at maturity; not evergreen.
Declinate. Curved downward.
Decumbent. Reclining, with tip ascending.
Decurrent. Applied to a sessile leaf having its base extended downward along the stem.

Flower shapes, drawn by C. T. Hansen



Leaf shapes, drawn by C. T. Hansen



Dehiscing. Gaping or opening, as of a seed capsule.
Deltoid. Triangular; shaped like the Greek letter Delta.
Dentate. Having teeth that point outward rather than upward.
Dimorphic. Occuring in two forms.
Discoid. Having the form of a disc.
Dorsal. Pertaining to the upper surface of a leaf.

Eglandular. Without glands.
Elepidote. Without scales.
Ellipsoid. A solid figure having every plane an ellipse or circle.
Elliptic. Oval; oblong narrowed to rounded ends.
Emarginate. Having the margin notched or indented at the apex.
Entire. Not cut or toothed.
Epiphyte. A plant growing non-parasitically upon another.
Erose. Having an irregular toothed margin, as if gnawed.
Evanescent. Fleeting or liable to disappear.
Exserted. Protruding from surrounding parts.

Farina. White powder.
Farinose. Covered with a white, meal-like powder.
Fasciate. Characterized by a flat or ribbon-like growth.
Fastigiate (branches). Erect and near together.
Ferruginous. Rust colored.
Filament. The stalk or support of an anther.
Filiform. Thread-like; filamentous.
Fimbriate. Fringed.
Flexuous. Bending alternately in opposite directions; slightly wavy.
Floccose. Having tufts of soft hairs or wool.
Floriferous. Bearing flowers.
Foliaceous. Leaf-like; having leaves.
Foveolate. Having foveola or little pits.
Fulvous. Tawny.

Gamete. A mature male or female sex cell.
Genus (pl. Genera). A group of species which are similar in many respects and presumably more closely related to each other than to other species.
Gibbous. Irregularly rounded; lumped or swollen on one side.
Glabrescent. Shedding hair; becoming glabrous.
Glabrous. Not rough or hairy; smooth.
Glandular. Bearing glands.
Glaucous. Covered with a bluish-white bloom.
Globose. Spherical.
Glomerate. Compactly clustered.
Glutinous. Besmeared with sticky or slippery moisture.

Heterozygous. That condition of an individual in which any given factor has been derived from only one parent, so that half the gametes will contain this particular factor, half will lack it; such an individual will not breed true with respect to this particular character.
Hirsute. Covered with rather coarse, straight hairs.
Hispid. Rough, with stiff hairs or bristles.
Homomorphic. Having the same form.
Homozygous. That condition of an individual in which any given genetic factor is doubly present, hence such an individual produces gametes of only one kind and breeds true with respect to a given character.
Hyaline. Glassy surfaced; translucent.
Hybrid. A cross-breed, usually with two or more species in its ancestry.

Imbricate. Overlapping like shingles.
Indumentum. Hairy or scale-like covering, often felt-like on the under side of the leaf.
Inflorescence. The flower cluster or flower arrangement.
Internode. The part of a stem between nodes or joints.

Lacunose. Furrowed or pitted.
Lamina. The blade or flat expanded portion of a leaf.
Lanceolate. Tapering like the head of a lance.
Lepidote. Scurfy with minute scales.
Ligulate. Strap-shaped.
Linear. Very narrow and elongate with margins parallel.
Lobate. Divided into lobes.
Lobe. A rounded projection or division.
Lobulate. Having small lobes.

Mealy. Having the appearance of being covered with meal.
Membranous. Thin and more or less transparent.
-merous. A suffix indicating division into parts, as 5-merous
Mucro. Small, abrupt tip of a leaf.
Mucronate. Terminating in a short straight point.
Mucronulate. Minutely mucronate.

Nectary. Nectar producing organ.
Nodular. Containing nodules; lumpy.

Oblanceolate. Widest near apex, tapering gradually to base; several times longer than wide.
Oblong. More or less rectangular and longer than broad.

Obovate. Widest near apex, narrowing abruptly to base and longer than wide.
Obtuse. Blunt or rounded at the end.
Orbicular. Circular.
Oval. Elliptical; egg-shaped.
Ovary. Seed bearing part of pistil.
Ovate. Egg-shaped; broadest near base narrowing abruptly at tip.
Ovoid. Egg-shaped solid; with ovate outline.

Papillae. Nipple-shaped projections of the outer walls of epidermal cells.
Papillose. Bearing papillae.
Papyraceous. Papery.
Partite. Cleft nearly to the base, as a leaf.
Pedicel. The stalk of a single flower.
Peduncle. The stalk of a flower cluster, or of an individual flower when solitary.
Pellicle. A thin skin, film or layer.
Peltate. Having the stalk attached on the under side near the middle.
Perianth. The floral envelope consisting of calyx and corolla.
Persistent. Remaining attached, not falling off.
Perulae. Leaf bud scales.
Petal. A division of the corolla.
Petaloid. Petal-like.
Petiole. The stalk of a leaf.
Phylogenetic. Pertaining to the history of the evolution of a secies or group.
Pilose. Covered with fine soft hair.
Pistil. The central seed-bearing organ, consisting of ovary, style and stigma.
Pollen. Powdery substance borne in the anthers; the male element.
Procumbent. Lying flat; trailing.
Puberulent. Covered with very fine hair or pubescence.
Pubescent. Covered with fine, soft, short hair.
Punctate. Covered with dots or depressions; dotted.
Punctulate. Minutely punctate.

Raceme. Inflorescence with flowers arranged along a stem, with the terminal flowers blooming last.
Racemose. In racemes.
Rachis. The axis of a flower cluster.
Recurved. Bent back or down.
Reticulate. In the form of a network; net-veined.
Retuse. Having a rounded apex in which there is a slight notch.
Revolute. Rolled backward or downward from the margins.

Rhombic. Four-sided with the sides oblique.
Rhomboid. Having oblique angles; diamond-shaped.
Rostrate. Beaked.
Rotate. Wheel-shaped; flat and circular in outline.
Rufous. Dull red; rust colored.
Rugose. Covered with, or full of wrinkles.
Rugulose. Slightly wrinkled.

Scabrid. Roughened with minutely scurfy points.
Scabrous. Rough to the touch.
Scaly. Having a covering of scales.
Scurfy. With scaly matter adhering to the surface.
Sebaceous. Fatty; waxy.
Sepal. A division of a calyx.
Serrate. Having sharp teeth pointing forward.
Serrulate. Finely serrate.
Sessile. Attached at the base without a stalk.
Seta. A slender spine or prickle; a bristle.
Setose. Bristly.
Setulose. Clothed with minute prickles.
Spathe. A large bract enclosing a flower cluster.
Spatulate. Shaped like a spatula.
Species (pl. Species). Each recognizable kind of wild plant (or animal), consisting of individuals which are very much alike, most of the differences being due to external conditions and not inherited; hence a plant species essentially breeds true and may be propagated by seed.
Stamen. The pollen-bearing organ of a flower, consisting of anther and filament.
Stigma. The pollen-receiving part of the pistil.
Stipitate. Elevated on a stipe or stalk.
Stolon. A trailing branch or runner which strikes root where it touches the ground.
Stoloniferous. Bearing stolons.
Stratum. Layer.
Strigillose. Minutely strigose.
Strigose. Rough with short, sharp appressed hairs.
Style. The portion of the pistil connecting the stigma and ovary.
Sub-. A prefix meaning slightly, nearly, or below.
Subacuminate. Somewhat acuminate.
Subacute. Not as pointed as acute.
Subchartaceous. Less paper-like than chartaceous.
Subcordate. Modified heart-shaped.
Subcoriaceous. Somewhat less leathery than coriaceous.
Subdecumbent. Somewhat more upright than decumbent.

Subdiscoid. Modified disc form.
Subfoliaceous. Somewhat foliaceous.
Subglobose. Not quite globular in shape.
Suborbicular. Not quite circular.
Subprocumbent. Somewhat less than prostrate.
Subretuse. Modified retuse.
Subsessile. Attached with almost no stalk.
Subterminal. Below the terminal.
Subtriangular. Modified triangular form.
Subtruncate. Nearly truncate.
Subumbellate. Not quite umbellate.
Subverticillate. Somewhat less than verticillate.
Suffruticose. Diminutively shrubby.

Tomentose. Covered with matted, wooly hair.
Tomentum. A form of pubescence composed of matted, wooly hairs.
Truncate. Appearing as if cut or broken off squarely.
Tuberculate. Nodular; beset with small, pimple-like tubercles.
Turbinate. Top-shaped; inversely conical.
Trichomes. Minute structures which have grown from epidermal cells of the leaves and consisting of papillae, hairs and scales.

Umbel. A flat topped flower cluster with pedicels springing from the same point.
Undulate. With a wavy surface.
Unicellular. Single-celled.
Unilateral. One sided; growing chiefly to one side.
Unistrate. Single-layered.

Venation. Arrangement of veins as in a leaf.
Ventricose. Inflated on one side.
Verruculose. Beset with minute, wart-like projections.
Verticillate. Arranged in a whorl.
Vesicular. Bearing or containing air cavities or vesicles.
Vestigial. Having become small or degenerate.
Villous. Covered with long, close, soft hairs.
Virgate. Long, straight and slender, like a wand.
Viscid. Sticky; adhesive; viscous.

Whorl. A set of leaves distributed in a circle round the stem.

Photo J. Harold Clarke

The Rhododendron Test Garden, Portland, Ore. Two 45 year old Cynthias flanking the monument bearing dedicatory sentiments.

A. R. S. CUMULATIVE INDEX

A great mass of useful and pertinent information about all types of Rhododendrons and their culture has been accumulated over the years in the A. R. S. Bulletins, 9 volumes to date, and the 5 Yearbooks, published from 1945 to 1949 inclusive. None of these publications had been indexed. It seemed advisable, therefore, to make a cumulative index covering all these previous publications. Since the early issues of the Bulletin did not have the pages numbered consecutively throughout a volume, it was necessary to give volume and number, as well as page number, for each entry and that system was carried on through the later issues. The Yearbooks are designated as Y5 for 1945 to Y9 for 1949.

In indexing the Bulletins an attempt was made to record each reference to a variety or species, unless it appeared in a very long list or table, or in a Show report. From the Yearbooks, however, the mere mention of a variety or species was not recorded unless the accompanying text contained some information which might be of value with reference to that particular plant group.

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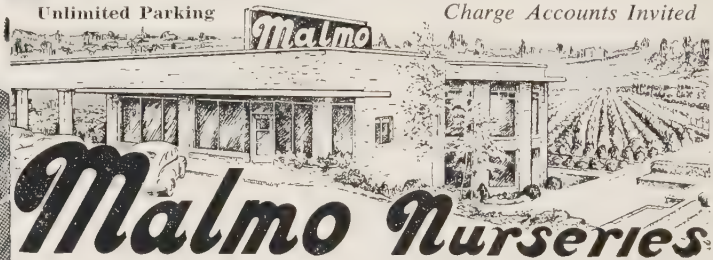

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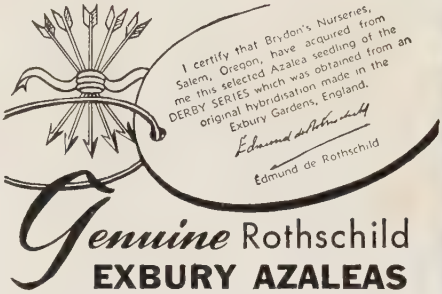
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THE AMERICAN RHODODENDRON SOCIETY is a non-profit organization whose objectives are: to disseminate information on rhododendrons and azaleas; to operate Test Gardens; to register names of new hybrids and to do all things necessary in the promotion, development, growing and culture of rhododendrons.

Membership is open to anyone interested in these plants. Dues are $5 a year. A Quarterly Bulletin is published which is mailed to all members. This Bulletin contains articles by growers, fanciers and collectors and is the best and most up-to-date information obtainable on rhododendrons. Local chapters of the society are formed in areas where the membership is large enough to support such organizations.

JOIN the American Rhododendron Society, mail dues or write for additional information to:

THE AMERICAN
RHODODENDRON SOCIETY
3514 N. Russet Street
Portland 17, Oregon

RHODODENDRONS

For about a century Rhododendrons have been used in planting American gardens. The first named horticultural varieties came mostly from England with a few from Holland. Varieties named in America began to appear about 1860, although some of these were American names for seedlings received from across the Atlantic, and other introductions of that era were probably from open pollinated seed of the European varieties.

During the last 30 years plant breeders in this country have been steadily increasing their efforts with Rhododendrons so that we now have some 200 named, American created, varieties. For the first time a comprehensive account of the work of these breeders, and a list of the varieties they have named, has been brought together in this edition of 'Rhododendrons'.

Among other items of particular interest are the American Rhododendron Society ratings of varieties and species, giving the novice a means of evaluating unfamiliar sorts by means of symbols which indicate their hardiness and horticultural quality. Some 340 horticultural varieties and 210 species are included in the rating tables. Lists of varieties for various uses, climates and localities, suggested by a number of experienced growers, will also be of great value to the beginner.

Chapters on culture, propagation, pest control, etc., written by individuals well qualified in the field of their writing, make the book a handy reference work for answering all kinds of questions concerning the growing of Rhododendrons.

There are many other features, a Glossary of technical terms used in describing Rhododendrons, descriptions of American Rhododendron Society Award plants, a discussion of fragrant Rhododendrons, Rhododendrons in the New York area, etc.

The book is illustrated with numerous pictures of Rhododendrons in the landscape, and closeups which show the individual variety and species characteristics.